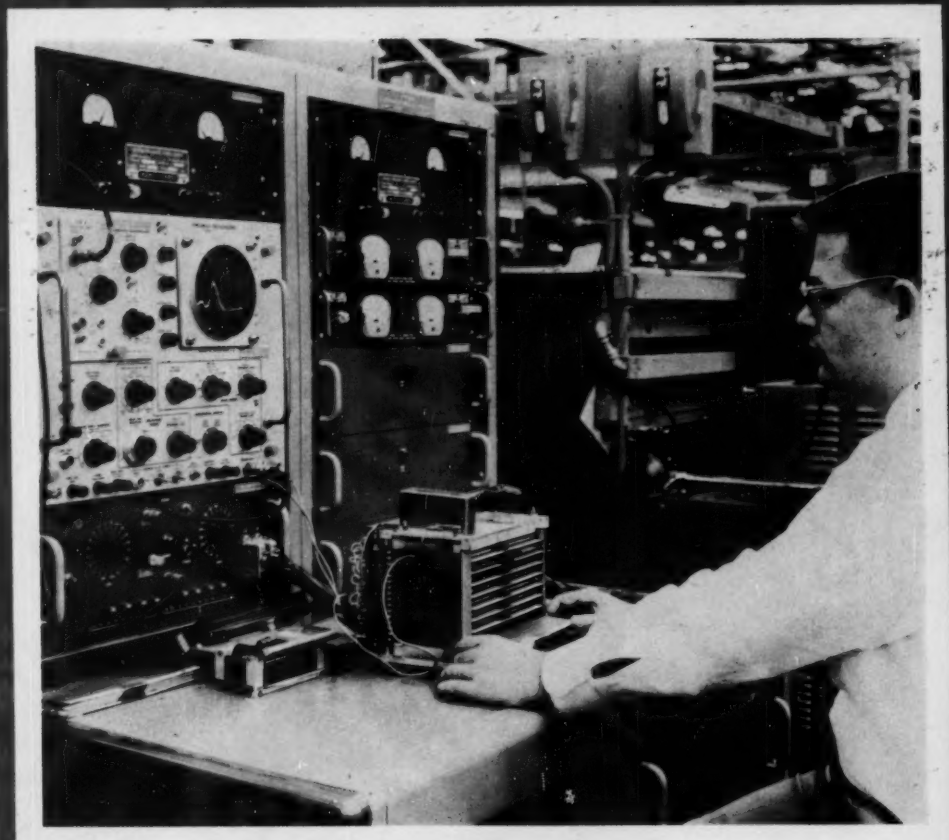
JANUARY 23, 1960
VOL. 158—NO. 4

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



Published every week at Saturday by TELEPHONY PUBLISHING CORP. 540 N. Dearborn St., Chicago 10, Ill. Subscription $4.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

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FLASHES AND PLUGS

OW! . . . CHEERIO, OLD BOY! It's bad enough for a husband to suffer from a toothache, but when that ache gives his wife a pain in the back, and when the pains continue for 21 days, this is almost unbearable.

The United Press reports it happened in England in December. Handel Bluer, 31, a keeper at the Longships lighthouse 2 miles offshore and the man with the toothache, was stranded, for there were stormy seas; and he had no telephone.

His loyal wife, Joan Bluer, was standing by, though. She was sending him dental advice, via semaphore flags, and it was the job of flag-waving for three weeks that caused her backache. But, said she, "I must keep up his morale."

•

'RAY FOR U. S. TELEPHONE SERVICE! When we read of heavy overseas telephone traffic during the recent holidays, Americans can again be thankful for the superb telephone service which we enjoy, and which achieves amazing connections, in minutes, on long distance calls.

It was reported that in New Zealand for eight days, Dec. 20-28, 1959, the Wellington Chief Post Office had full bookings on radiotelephone calls to London. It was said that additional calls were on the waiting list, and would be fitted in, if radio conditions were particularly good.

New Year's Day, 1960 also was fully booked a month in advance. One man even booked his call to London for Christmas Day, 1960!

•

PRESIDENT'S ON THE JOB. A *Jerusalem Post* reporter recently telephoned the Presidential residence for information about an official visitor to Israel. Having a deadline to meet, the reporter was insistent about getting the information fully and immediately.

After the party answering the telephone had looked several things up for him, and given him the complete information, the reporter asked, "Who am I speaking to, please?"

"This is the President speaking," was the answer.

The reporter apologized for troubling Mr. Ben-Zvi, and explained that he had assumed that he was speaking with the President's secretary.

"Oh, no," said President Ben-Zvi, "he's off by this time."

•

FOREWARNED. A sign on a television repair shop in Union, N. J. advises, in large letters, "DO IT YOURSELF" continuing, in smaller letters, "Then call this number," and, of course, providing the store's telephone number.

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

January 23, 1960

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Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 30c per copy (except special issues—50c). Subscription $4.50, 1-year; $7.00, 2-years; $9.00, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

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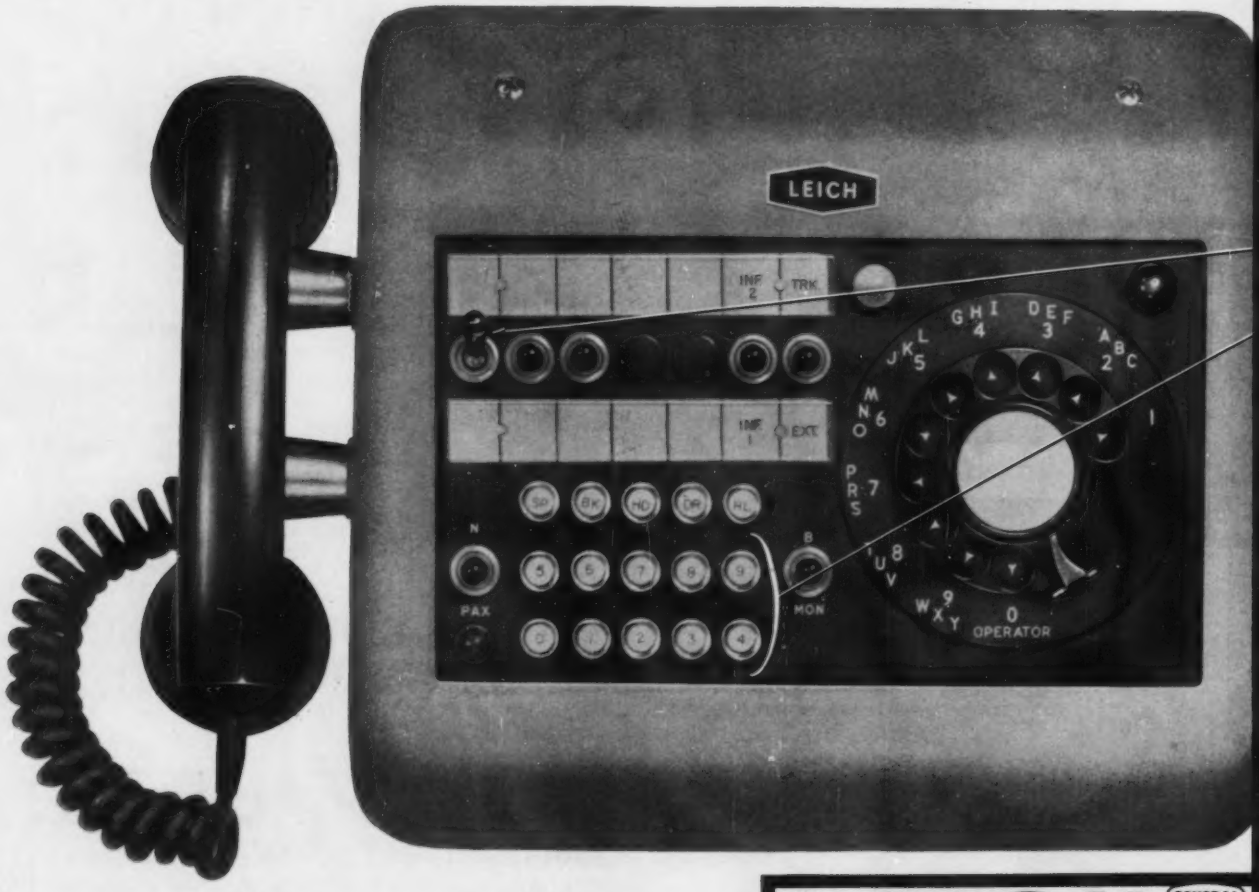

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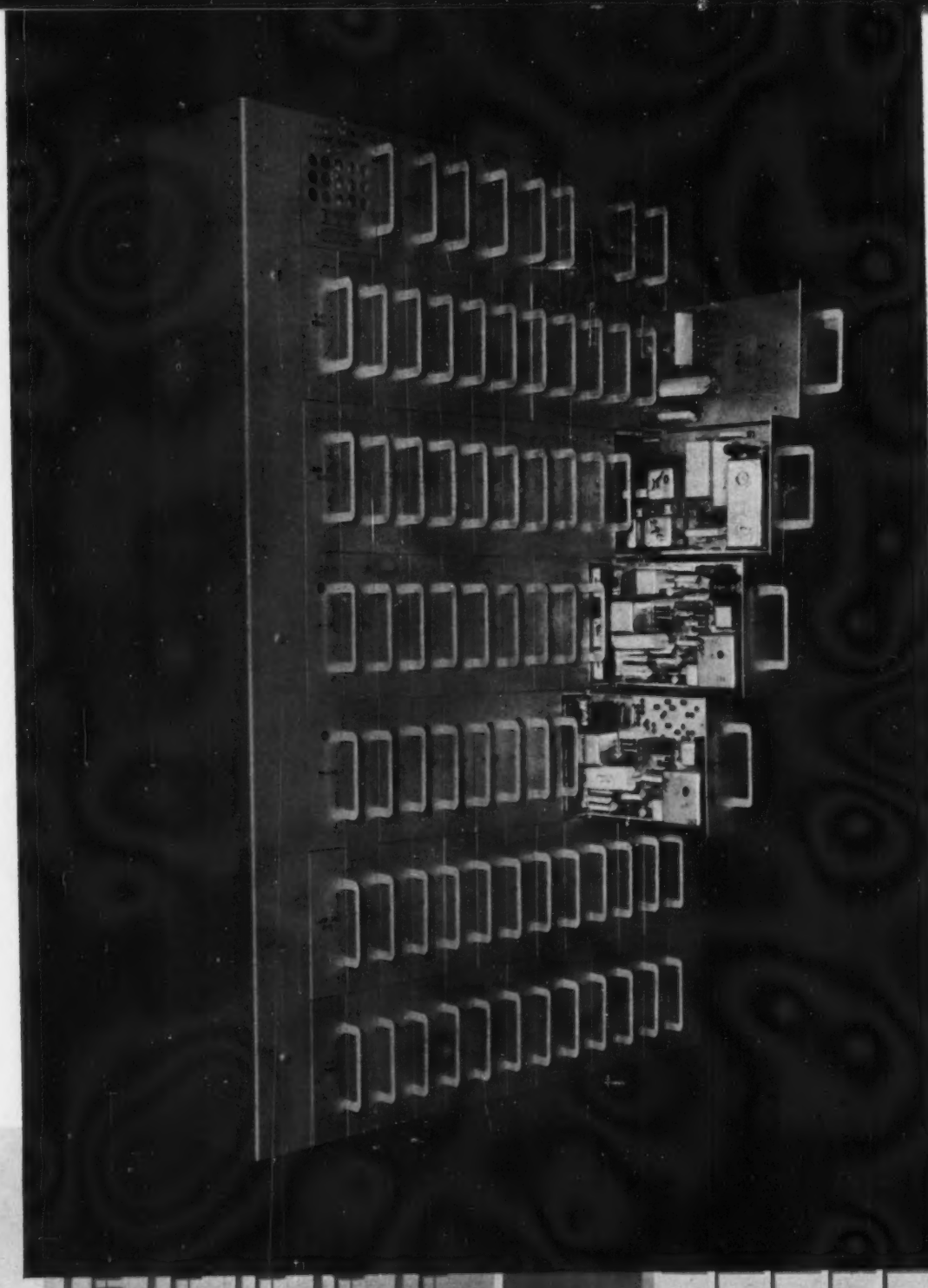

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Kellogg's NEW K-24 SHORT HAUL cable carrier

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Here are some reasons why the K-24 belongs in your modernization and growth programs:

- ☑ The K-24 has been specifically designed for economical application between 5 and 20 miles.
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- ☑ The K-24 can increase the capacity of existing cable manyfold, deferring substantial investment for new cable, conduit or pole lines to care for trunk circuit growth.

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A wide range of signalling options for most exchange applications, including that used between panel and crossbar offices, can be provided with the K-24.

For complete technical details on this latest achievement of Kellogg-ITT research, write Kellogg's Carrier Division at 2912 Wake Forest Road, Raleigh, North Carolina.

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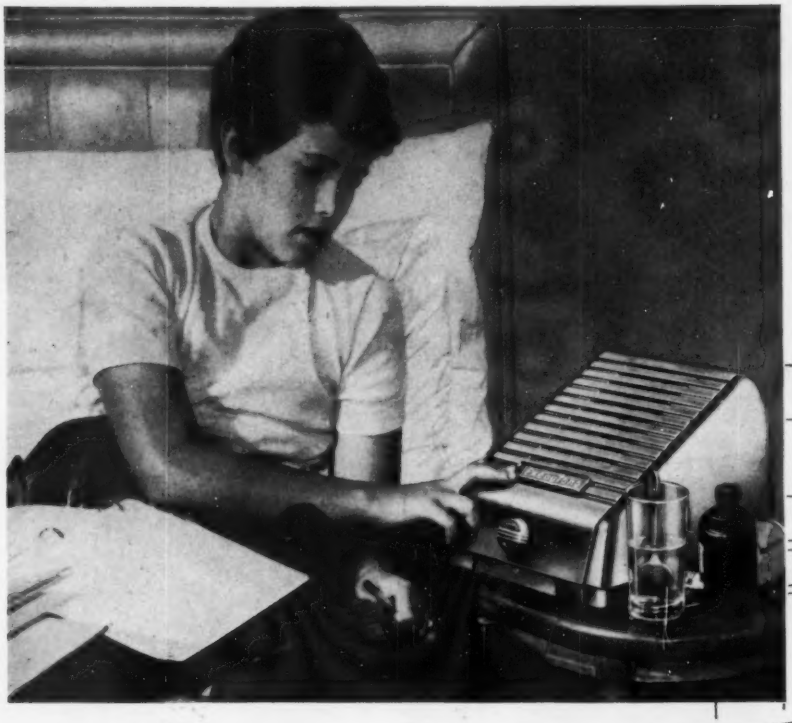
to School by Telephone!



and the school classroom.

Executone School-to-Home equipment consists of a compact amplifier and microphone-speaker for the student, an amplifier unit for the school and a portable classroom station.

You can supply the Executone School-to-Home System to your community's schools, at modest cost. For complete information, call your Automatic representative or your nearest A. E. Sales Corporation warehouse.

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A WELL-EARNED PLUG FOR A WELL-KNOWN PRODUCT

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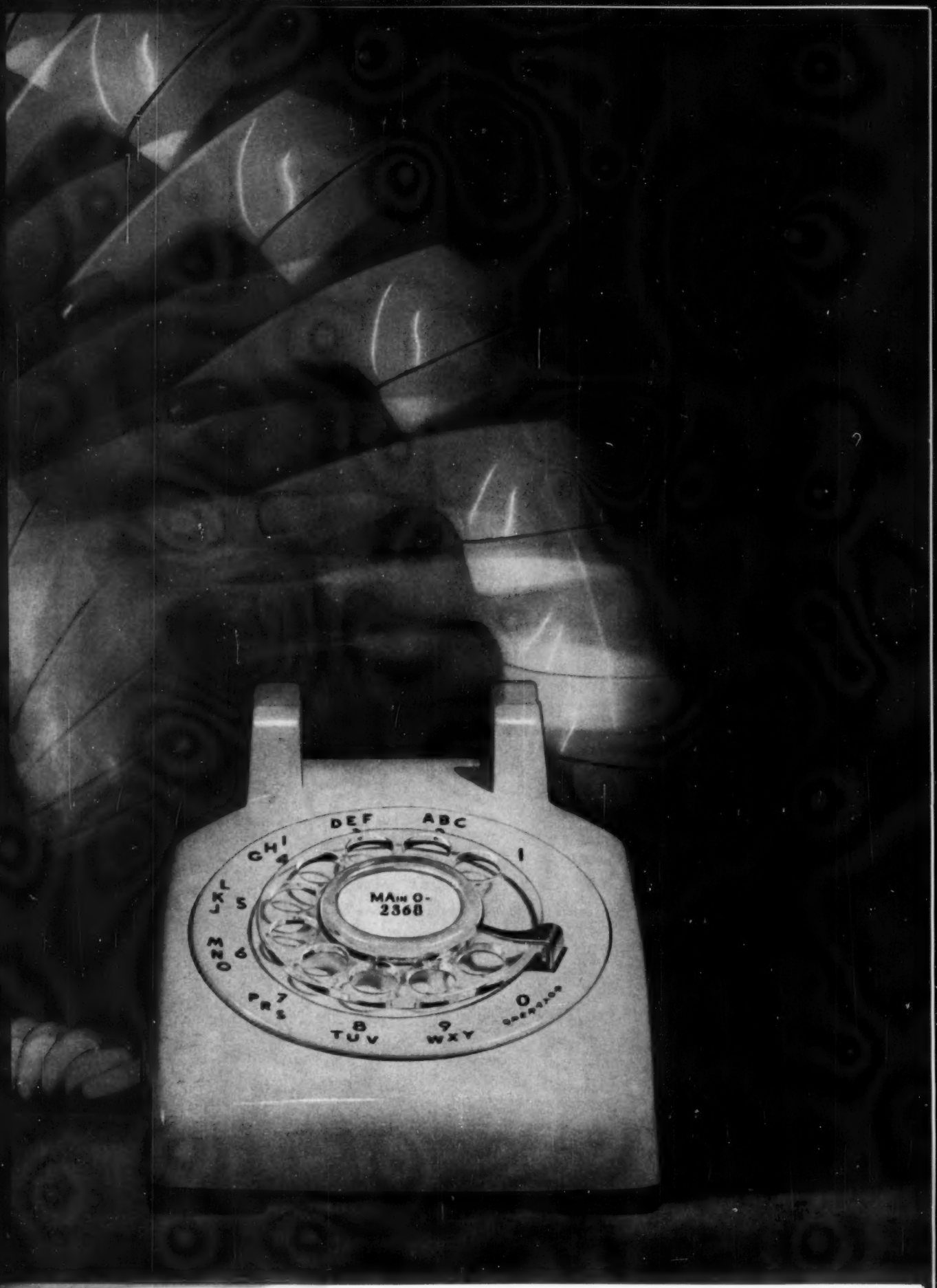
Rarely if ever does anything go wrong with it, but when that happens the repairs are fast and free. Day after day, year after year, it gives dependable service.

This month in national magazines we're reminding customers of every telephone company of this important fact about the value of the telephone. The ad features the arresting photograph you see here. The headline is: "Does anything else you use so often give you such trouble-free service?"

It's a richly deserved tribute to a good product, and one that telephone people everywhere can take pride in.

BELL TELEPHONE SYSTEM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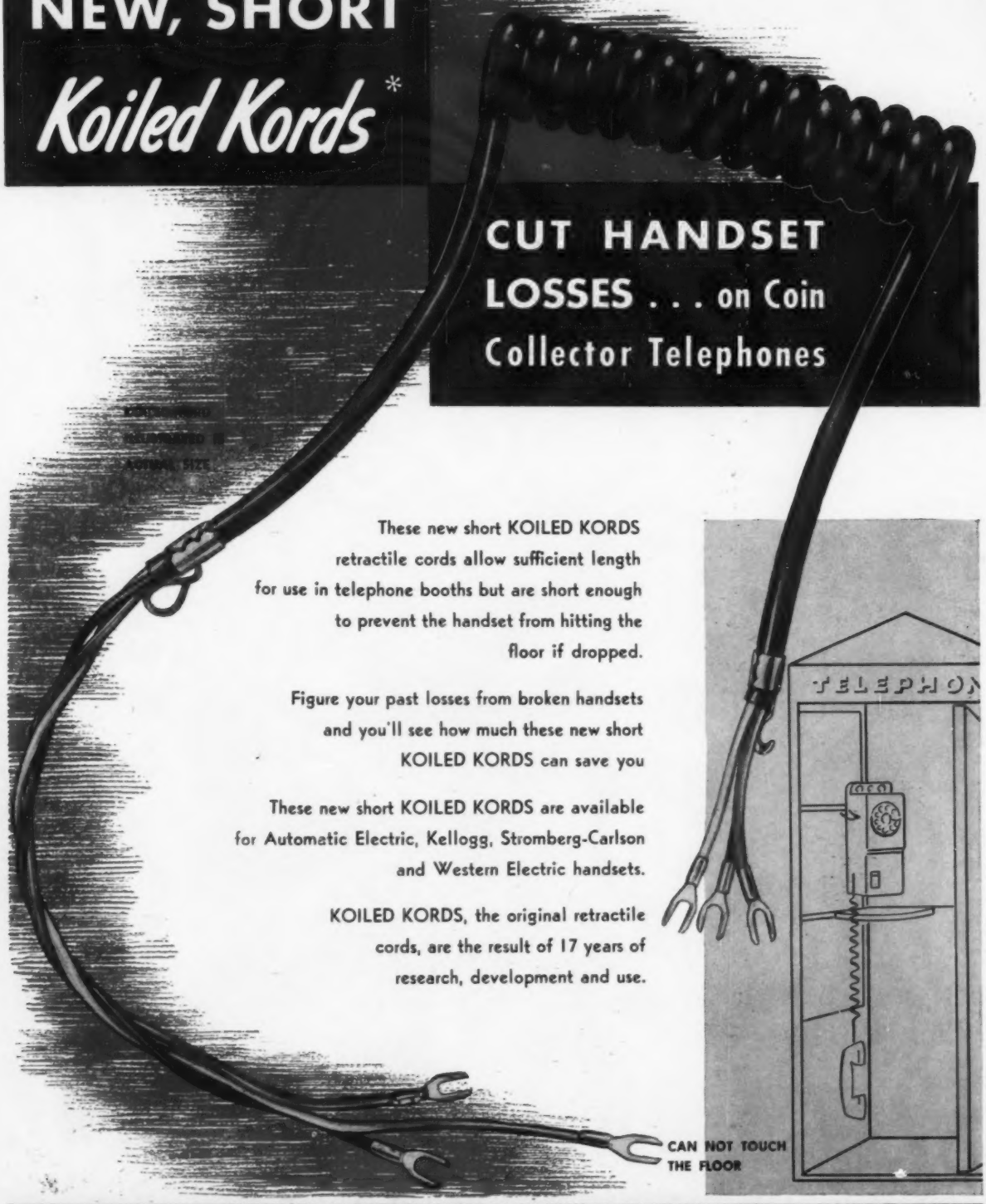

These new short KOILED KORDS retractile cords allow sufficient length for use in telephone booths but are short enough to prevent the handset from hitting the floor if dropped.

Figure your past losses from broken handsets and you'll see how much these new short KOILED KORDS can save you

These new short KOILED KORDS are available for Automatic Electric, Kellogg, Stromberg-Carlson and Western Electric handsets.

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WHETHER your expansion requirements call for carrier for use on open wire, cable or radio —or for microwave facilities, extension of physical circuits, or any combination of these – the AE-Lenkurt team of experienced *telephone* engineers is able to give you impartial recommendations on the system best suited to your needs. That's because we have a *complete* line, and have no interest in selling one system over another.

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Lenkurt's 45-class "network-engineered" carrier equipment provides high reliability over the years —meets virtually all multichannel communications conditions.

Type 45A provides 12 channels for open-wire application, short- or long-haul. Type 45C is stackable in 4-channel groups. Either of these systems can be used on the same open-wire pair with a 3-channel Lenkurt 33A or other low-frequency carrier. Type 45BN is a 24-channel system for cable, and Type 45BX provides up to 240 channels for microwave transmission. All 45-class systems are directly interconnectable at carrier frequencies.

Arthur H. Stoutenberg inspects General Telephone Company of Florida's 45BX Carrier installation on the third floor of the Tampa office building.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR
AND EDITOR, PUBLIC UTILITIES FORTNIGHTLY

Discusses Louisiana Supreme Court decision finding that Southern Bell's rates are not just and reasonable and directing state commission to hold new hearings on application for increased rates. . . . Says company must get at least 6 per cent rate of return.

THE decision of the Louisiana Supreme Court, handed down on Jan. 11, in the Southern Bell Telephone Co. rate case is remarkable for a number of things. But the first reaction which comes to the mind of this writer, who has been following the broader aspects of this controversial case for a number of years, was that it seems to be the first real break-through in a very difficult area of regulatory resistance to rate relief, for this Bell System company.

As most regular readers of this publication may well be aware, Southern Bell has had more than its share of rate case difficulty in several of the Gulf states—Louisiana, Mississippi, Alabama, and in nearby Tennessee. A good deal of this difficulty has grown out of the use of a certain formula of regulatory computation which has won the approval, in whole or in part, not only of the respective state commissions in those states, but to some extent of the state courts as well.

Without going into the complexity of this formula, it might be said that it involves a combination of assumptions, all of which are rather prejudicial to any case built up to get increased rates based on the expansion and rendition of modern telephone service in an inflationary price period (such as we are even now experiencing). There was, for example, the use of a hypothetical debt ratio in order to justify an assumed cost of money. And on top of that, there was the use of a hypothetical tax savings which would have resulted if the company had financed according to the assumed ratio, rather than paying taxes on the actual proportion of its bond and stock financing. And there was also a rather restrictive determination of the rate of return, based on cost of money which, in turn, was almost automatically fixed by comparative earnings-price ratio of other utilities.

Indeed, the use of cost of money, as almost the sole test of the adequacy of the return allowance, was so pronounced as to eliminate, for practical purposes, the need for determining the rate base. In other words, if the over-all cost of money for a telephone company financed by so much stock and so many bonds is the measure of the allowable profit for that company, then the actual dollar investment in the plant, as determined by cost figures or otherwise, becomes almost a side issue. All the regulatory authority has to do is figure out how much money the company needs to take care of its security obligations, and that could become the dollar limit of the return allowance, over and above operating expenses. There would be little actual need to go through the motions of figuring out the cost of the plant in service.

Anyhow, to get back to this important decision of the Louisiana Supreme Court, it is apparent, from reading Judge Viosca's majority opinion, that some very disturbing economic chickens had come home to roost, as a result of the rather stiff treatment handed out in the past on Louisiana telephone rate increase applications.

Pressure for Additional Investment

The back history of Southern Bell's rate troubles in Louisiana since the end of World War II is a bit complicated. Just by way of highlights, the reader may recall that Southern Bell obtained two rather small and one rather medium-size rate increase between 1947 and 1952, amounting in all to something less than 15 million dollars a year. But it was in 1956, in the middle of the postwar inflationary spiral, that the Louisiana commission startled regulatory circles throughout the country by ordering the company to *reduce* rates 20 per cent. This resulted in a dollar amount reduction of nearly 4 million dollars a year (14 PUR3d 146). It was in this case that the restrictive formula, mentioned above, with all its assumptions about debt ratios, taxes, tax savings, cost of capital, and earnings-price ratio, was invoked. And this was unanimously upheld by the Louisiana Supreme Court in 1957.

Following this rate reduction, the company let it be known that it did not feel it could guarantee the continued expansion of its plant and services in Louisiana under such a subnormal return on the investment. Evidently the impact of this situation did not disturb the commission because, when the company again applied in August, 1957, for an emergency increase of 7 million dollars a year, the commission denied all rate relief even while admitting that the company might be entitled, under its own computation, to an increase of $1,918,707. The reason for its refusal to grant even such a small rate boost was the very fact that the commission considered the company's services in Louisiana inadequate.

And, so, there was an impasse which had to be broken one way or the other. The company was saying, in effect, "we cannot in justice to our investors expand service in Louisiana as long as we can look for only a meager return on

their investment." The commission, on the other hand, was saying to the company "unless you do invest to expand your plant and service facilities in Louisiana, we will not even give you such limited rate relief as you might be otherwise entitled to obtain."

To make a very long story quite short, the company persisted in seeking rate relief, and appealed again to the Louisiana Supreme Court. By this time, the specific increase requested amounted to more than 14 million dollars a year. As to the rate of return, the company asked for a 7.5 per cent on net investment (the rate base used by the commission) and claimed that its actual earnings, under the rates allowed, by the commission, amounted to little more than 4 per cent in 1957. The state's high court now says the company must get at least 6 per cent.

What did the court think about this conflict of views—as to whether the company was entitled to fair treatment *before* making an additional investment for plant expansion, or should be penalized for *not* making such investment, regardless of the adequacy of earnings? Evidently a majority of the Louisiana Supreme Court has come to feel that the telephone company has a right to some advance assurance of fair treatment. And, in this case, it has ordered the Louisiana commission to grant an increase of rates sufficient to yield at least a 6 per cent return on net investment.

The court was evidently impressed by the evidence of so many citizens, in and out of business, demanding adequate, modern telephone service on an economic basis sufficient to provide it. The majority opinion said of this:

"The record shows that there is great necessity for an immediate expansion program in Louisiana. Realtors, developers, contractors, manufacturers, farmers, and businessmen of every character have testified to the necessity of an immediate heavy construction program for additional telephone service. Business in the state, according to the testimony, is being severely handicapped because it is impossible to get the necessary service. Occupants of homes are likewise being seriously inconvenienced. . . .

"The large amount of capital necessary to meet the expansion needs of Louisiana, as well as the amount necessary to revise the capital structure to meet the demands of the commission's formula, must be raised in the money markets in competition with other utilities whose stock and bonds are more attractive to investors because of their greater returns. While we are dealing here with intrastate rates only, we cannot build a wall around Louisiana and say this capital must be raised in Louisiana alone. Even if we adopted such a provincial attitude, there would be no way of preventing utilities located in other states from competing with Southern Bell in Louisiana for Louisiana capital. The answer is there must be no discrimination."

Convention Calendar

1960

Association	*Date*	*City*	*Hotel*
Minnesota	Feb. 7, 8, 9 and 10	St. Paul	St. Paul
Mississippi	Feb. 15 and 16	Unannounced	Unannounced
Louisiana	Feb. 24 and 25	New Orleans	Jung
Kentucky	Mar. 1	Lexington	Phoenix
Texas	Mar. 7 and 8	Dallas	Baker
North Dakota	Mar. 21 and 22	Fargo	Gardner
Ohio	Mar. 28, 29, and 30	Columbus	Deshler Hilton
Iowa	Apr. 5 and 6	Des Moines	Ft. Des Moines
Nebraska	Apr. 19 and 20	Omaha	Sheraton-Fontenelle
Indiana	May 4 and 5	Indianapolis	Claypool
Wisconsin	May 10 and 11	Milwaukee	Plankinton House
Illinois	May 19 and 20	Springfield	Abraham Lincoln
Kansas-Missouri*	May 23 and 24	Kansas City	Town House
Pennsylvania	June 6 and 7	Bedford Springs	Bedford Springs
California	June 8, 9 and 10	San Francisco	Fairmont
Washington-Oregon*	June 16 and 17	Portland	Sheraton Portland
New York	June 20, 21 and 22	Schroon Lake	Scaroon Manor
Tennessee	Sept. 7 and 8	Nashville	Hermitage
Arkansas	Sept. 12 and 13	Hot Springs	Velda Rose Motel
Michigan	Sept. 12 and 13	Mackinac Island	Grand
Rocky Mountain	Sept. 14, 15 and 16	Denver	Hilton
New England	Sept. 25, 26, 27 and 28	Bretton Woods, N. H.	Mt. Washington
North Carolina	Oct. 4 and 5	Pinehurst	Carolina
USITA	Oct. 9, 10, 11 and 12	Chicago	Conrad Hilton
Oklahoma	Nov. 9 and 10	Oklahoma City	Skirvin

*Joint Convention

Position of CWA

One of the surprises in this case, to this writer, was the fact that the union representing the company's employes—Communications Workers of America, AFL-CIO—filed a brief as a "friend of the court" in support of the company's position. That does not usually happen. In fact, it does not often happen. In the past, Communications Workers of America has sometimes turned up on the other side of a rate case opposing increases requested. But, in this instance, evidently the organized telephone workers, as well as other people in Louisiana, are convinced that a continued paralysis of telephone company expansion could only result in a stagnation of the business and a consequent loss of job opportunity and job security. The court quoted from the CWA brief as follows:

"Of equal importance to CWA members in Louisiana was a figure showing the earnings of Southern Bell in the other eight states in which it operates. Southern Bell's earnings in the other eight states, or its earnings excluding Louisiana, was 6.4 per cent for the first half of 1957. We believe it is only natural to expect the company to invest more money for expansion and thereby give more work and create more jobs in the other states where it can earn so much more on its investment. The union does not believe that this court should approve a rate which may have the effect of depriving many citizens of the state of job opportunities and job security.

"As shown at the hearings, there is a great demand for telephone service in Louisiana. The company estimated it would have to spend more than 46 million dollars a year on new construction to meet this demand. The members of CWA, as citizens, want to see this state get the telephone service it needs in addition to the increased work and job opportunities which would result. If reasonable rates are approved, the company should be able to raise and invest the money to meet this need for telephone service, and all the people will benefit therefrom."

The court did not disagree with the commission's assumption of a higher debt ratio, in itself. But it was pointed

out that a change in such debt ratio, even if followed by the company, would take about five years to complete, during which time it could not actually realize the hypothetical tax savings. The court also disagreed with expert testimony used by the commission on earnings-price ratio, which it said was not very reliable. In addition to the "end result" test based on at least 6 per cent of net investment, the court also commented upon comparable earnings of other utilities. On an equitable basis, it was found that Southern Bell had suffered discrimination.

The court seemed to agree with the commission's view, however, that no return allowance was necessary on the basis of accumulated surplus since it had, in effect, been contributed by the subscribers. One judge dissented. Two judges wanted to allow 6¼ per cent. Cost of money was found to be not less than 5 per cent, not 4 per cent as found by the commission on the basis of its own expert witness' testimony.

In addition to its comment on the unreliability of earnings-price ratio testimony (by both the commission and the company's witnesses), the court was evidently impressed by the comparison of Southern Bell's earnings in Louisiana with other utilities elsewhere. These undisputed figures showed an average rate return (on a property rate base) of 6.4 per cent for all large electric utilities in the South; 10.1 per cent for manufacturers, 6.5 per cent for the Bell System as a whole, but only 4.07 per cent for Southern Bell in Louisiana in 1957. Hence the conclusion of Judge Viosca that the commission's formula for fixing rates had resulted in an unjust discrimination against the company. He stated in part:

"The correctness of these computations is not disputed by the commission. It is the commission's position that Southern Bell is not similar to these other utilities, notwithstanding its inconsistency in taking its earnings-price ratio from most of them.

"It is obvious that there is a great disparity between the return received by Southern Bell on its property rate base as well as on its equity capital and the return received on property rate base and equity capital by other utilities in Louisiana, in the nine southern states in which Southern Bell operates, and in the United States."

Uncle Sam's Secret Recorders

Remember a few years ago when the Federal Communications Commission, with great formality, laid down rules and regulations binding on the telephone company with respect to the use of recording equipment in conjunction with interstate telephone messages? The gist of the edict was that there should be a distinctive "beep," at regular intervals, so that the parties to the conversation would know that it was being recorded. We have all heard these "beep" pocked recordings on news broadcasts, via radio or television.

But the FCC's rules are necessarily limited to the use of recording equipment either physically connected with the telephone facilities, or otherwise, so arranged as to be an integral part of the telephone reception. Without saying so, the FCC realized at the time that the recorders of a self-powered electronic type, which do not have to be physically connected with telephone facilities—indeed to not even have to touch any part of them—could not be banned as a practical matter.

Theoretically, of course, the use of information obtained by *any* unauthorized interception of interstate telephone communications is against the law because it violates the Federal Communications Act. But it is something like the law against the unregistered possession of firearms or other concealed weapons. The prohibition is observed by the scrupulously honest citizen, who does not need policing, or by police enforcement officials trying to obtain evidence. The underworld pays little attention to such restrictions if they happen to get in the way of illicit operations.

Yet it may surprise some to learn that there are a number of those midget microphone recording jobs now being used on the "QT" by government employes in carrying out their duties for various federal agencies. How do we know? Well, the information came out the other day in Washington in a round-about fashion. The Senate Constitutional Rights Sub-committee, headed by Sen. Thomas C. Hennings Jr. (D., Mo.), early this month received information that 17 miniature microphone recorders, of a type manufactured in West Germany and marketed in the United States, were purchased by five government agencies during the last six months of 1959.

The Army, the Navy, the U. S. Bureau of Standards, the Air Force, and the Internal Revenue Service were among the agencies mentioned as making use of the device. In addition to that, a number of private citizens, such as contracting firms having business with the government, use them. And so do some private detectives and some newspapermen. It is a very handy gadget—no bigger than a man's hand—to carry around in one's pocket or briefcase, and make recordings of any given conversation, without those engaging in the conversation knowing that they were being taped.

In a signed article by Julius Duscha, staff reported for the Washington *Post Times-Herald*, published on Jan. 8, the Hennings subcommittee's information about the 17 recorders purchased by the five government agencies in the last half of 1959, was pretty small potatoes indeed. Mr. Duscha's newspaper story resulted from an interview with the distributor of the miniature recording device in the Washington area; and this party estimated that some 1,000 of the tiny gadgets are used in the Washington area. The story contains some additional "color" to the effect that the tiny microphone might be embedded in tie clasps, wrist watches, brooches, and metal initials on handbags.

Other federal agencies said to be using the device are those which one would naturally expect to use them—the Federal Bureau of Investigation (FBI), the Central Intelligence Agency (CIA), and other government agencies engaged in government surveillance. The Washington *Post* story contained an estimate by the Washington area dealer that about 300 of the tiny wire recorders have been sold to the government during the past five years.

Not all of these recorders are necessarily used in snooping activities either legitimate or otherwise. One of the most unusual uses was that of the Army's Diamond Ordnance Fuse Laboratories, which are situated in Washington next door to the National Bureau of Standards. These recorders are used in connection with research on bomb disposal. And, since the work is secret, nobody is talking about it. But much was also made of the fact that the government's technical experts—overlooking no bets—have taken the recorders apart and tested component items for possible use or application in connection with missile guidance and other military purposes.

In the Air Force, for example, when a pilot is ejected from a jet plane in an emergency, his little recorder is supposed to go on automatically and the pilot is supposed to start talking about what happened all the way down to earth—if he gets there, or if the recorder survives and he doesn't. The Internal Revenue Service, of course, uses such a device in gathering evidence in racketeering, attempted bribery, and other wrongdoing in the tax field which might be brought to proper attention through the little eavesdropping gadget.

Of course, Senator Hennings' subcommittee, an arm of the congressional branch of our government, is in no position to cast aspersions on the administrative branch because of the use of "bugs" in gathering evidence. It was only a little more than a year ago that

(Continued on page 37)

Use of Economic Statistics

To Forecast Telephone Growth

By MICHAEL E. SPAUTZ

This article is an adaptation of a paper presented before the American Statistical Association's Business Indicator Committee at Los Angeles, Cal., in October, 1959. The subject "Composite Economic Indicator" was designed by Michael E. Spautz of the Planning Section of the Revenue Requirements Department, General Telephone Co. of California, under the supervision of Marshall C. Hea.

A FORECASTER has been described as a person who predicts what is going to happen — and later explains why it didn't. We of the General Telephone Co. of California are amused by, but not satisfied with, this description. A business such as ours must be concerned with the reliability of its forecasts for the following reasons:

(1) As a public utility, the telephone company must be prepared to supply service to all customers within its franchise area. Because of the time required to engineer, purchase and install the required facilities, it is essential to know well in advance just where, when and how much growth will occur.

(2) As a privately-owned and operated business, the telephone company must invest the stockholders' money in the most profitable manner consistent with the public interest. A forecast that is too high can result in overbuilding, with a consequent decline in earnings.

Recognizing the necessity of accurate forecasting, we have been striving to improve our techniques—to transform the *art* of forecasting into a *science* of forecasting — if that is possible. In order to minimize the subjectivity which is inherent in forecasting and profit planning, we recently made a study which, in essence, was an attempt to reduce to measurable, qualitative terms the relationship of basic forces currently working in the economy to future telephone demand. It never was a secret that telephone growth is a function of other variables, chiefly increasing population, disposable income and desire for service, but the scarcity of relevant statistics has made it impossible to measure these variables accurately on a current basis, or to correlate them in a useful manner with the dependent variable — demand for telephones.

During the post World War II years, General Telephone Co. of California, perhaps more than most other Independent telephone companies, suffered from severe growing pains. It was a period when our resources were strained to the utmost in the attempt to satisfy the apparently insatiable demand for service. Indeed 10 years ago we were holding in excess of 30,000 applications for service—and it was not until the 1957-1958 recession that we managed to catch up with the demand in most of our serving areas. Until then we did not especially need an accurate short-term demand forecast—we were swamped in any case.

MICHAEL E. SPAUTZ

Several years ago we made a preliminary study to determine the relationship between dwelling units in building permits and subsequent increase in demand. This study indicated such a poor relationship that nothing useful resulted, and the study was abandoned for more urgent problems. We were especially handicapped by the lack of accurate historical dwelling data for our scattered, relatively suburban serving area. (Our last serving area acquisition of a long series occurred just 10 years ago.) Furthermore, none of the other indicators that appeared to be logically related to telephone demand were available for our serving area alone, but were in terms of counties and cities, which overlap

our boundaries irregularly. The situation appeared almost hopeless.

In 1958, however, the heavy backlog of pent-up demand having been reduced, the time was ripe for a new look at the size of the market. Accordingly, our new revenue requirements department began, among other projects, a study of the local economy in relation to our telephone growth. The objective was, of course, to find relationships that would be useful tools for efficient planning of our operations. Our study started with a systematic investigation of all the available local indicators, as found in various publications. (Our chief source of extra-company data proved to be the *Monthly Summary* published by the Security First National Bank of Los Angeles.)

In all, we studied the historical trends of well over 40 series, adjusting them for seasonality, population and inflation where necessary, converting them to increments, creating indexes and ratios, relating them in various ways to each other and to telephone demand. For example, we found that by converting total employment into quarterly *gains*, a cyclical pattern emerged that was not readily apparent in the raw data. The same with bank debits. And by adjusting help wanted ads for increases in the size of the labor force, a more meaningful indicator resulted. We tried monthly and quarterly comparisons, with various leads and lags, keeping on the lookout for directional correspondences in trend, but harboring no illusions of finding perfect correlations with telephone growth.

Some of the indicators we studied appear to be measures of the economic forces that theoretically influence telephone demand — such as population growth, as measured by building permits, lots recorded, marriage licenses issued, autos entering the area. Other indicators, which bear no obvious direct relationship to telephone demand, such as petroleum production, failure liabilities and ship arrivals, were also investigated, in the hope of finding unsuspected significant relationships. Several indicators that we had been watching for years proved to be inadequate for our purposes—such as capital investment in industry, number of business failures, postal receipts and construction employment.

Finally, after sifting through all the available data, we selected 13 series that appeared to have a fairly close quarterly relationship to new telephone demand on an empirical basis. (Let us hope the number 13 has lost its traditional influence!) We found that although no single indicator is sufficiently accurate by itself, a simple composite appears to be consistently related to telephone growth — at least in retrospect.

Accompanying this article is a copy of this Composite Economic Indicator *(Fig. 1)*. It should be emphasized from the beginning that this composite is still in the experimental stage, subject to verification and/or revision with future experience. (Already we are planning to eliminate or substitute other indicators for taxable retail sales and new cars, sold, because of their tardiness). Furthermore, the composite indicates only *change in direction* of trend by quarter, as compared to the same quarter of the previous year, *not*

(Continued on page 46)

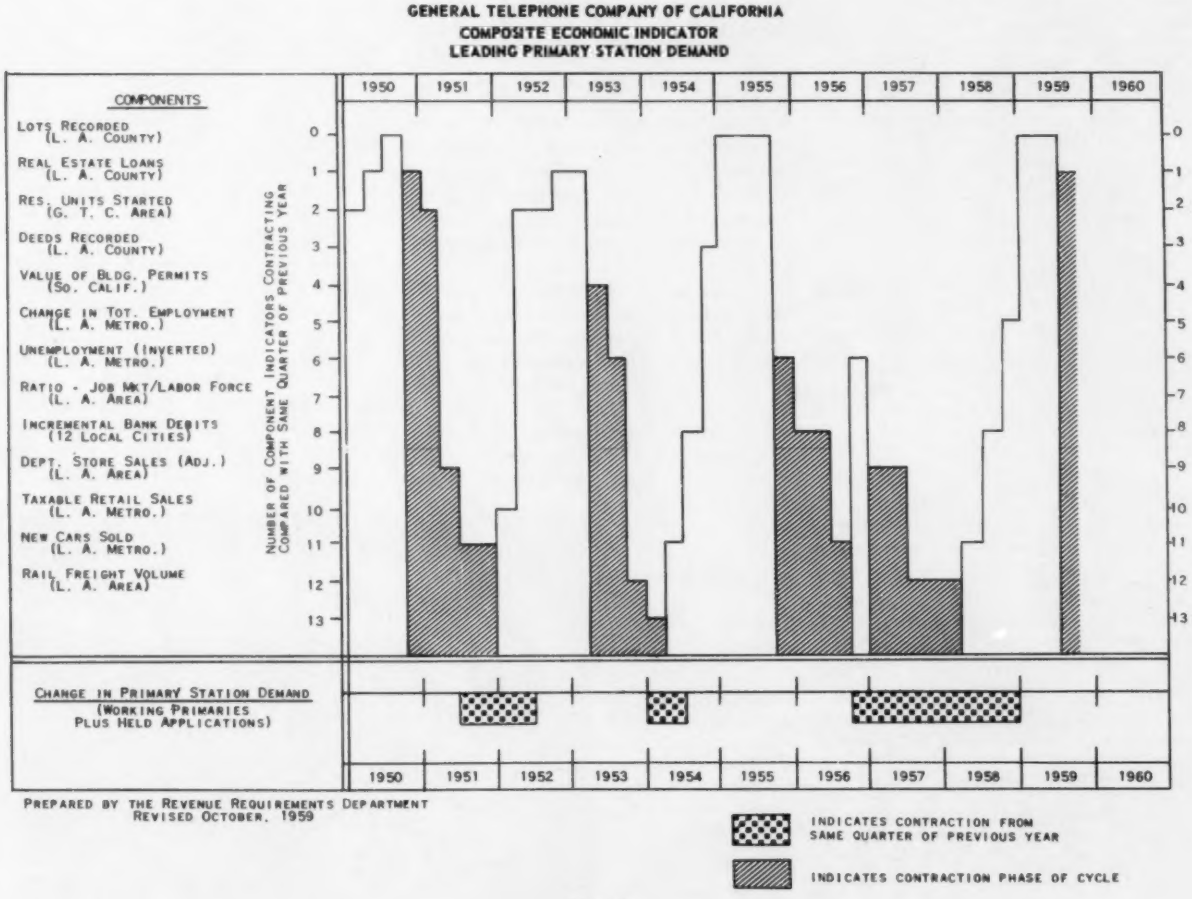
GENERAL TELEPHONE COMPANY OF CALIFORNIA
COMPOSITE ECONOMIC INDICATOR
LEADING PRIMARY STATION DEMAND
COMPONENTS
LOTS RECORDED (L. A. COUNTY)
REAL ESTATE LOANS (L. A. COUNTY)
RES. UNITS STARTED (G. T. C. AREA)
DEEDS RECORDED (L. A. COUNTY)
VALUE OF BLDG. PERMITS (SO. CALIF.)
CHANGE IN TOT. EMPLOYMENT (L. A. METRO.)
UNEMPLOYMENT (INVERTED) (L. A. METRO.)
RATIO - JOB MKT/LABOR FORCE (L. A. AREA)
INCREMENTAL BANK DEBITS (12 LOCAL CITIES)
DEPT. STORE SALES (ADJ.) (L. A. AREA)
TAXABLE RETAIL SALES (L. A. METRO.)
NEW CARS SOLD (L. A. METRO.)
RAIL FREIGHT VOLUME (L. A. AREA)
NUMBER OF COMPONENT INDICATORS CONTRACTING COMPARED WITH SAME QUARTER OF PREVIOUS YEAR
0 1 2 3 4 5 6 7 8 9 10 11 12 13
1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960
CHANGE IN PRIMARY STATION DEMAND
(WORKING PRIMARIES PLUS HELD APPLICATIONS)
1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960
PREPARED BY THE REVENUE REQUIREMENTS DEPARTMENT
REVISED OCTOBER, 1959
INDICATES CONTRACTION FROM SAME QUARTER OF PREVIOUS YEAR
INDICATES CONTRACTION PHASE OF CYCLE

Fig. 1

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THE FOLLOWING is quoted from Columnist Anthony Lejune of the London *Daily Express* in a discussion of the Bell System's "push-button" telephone, under the date of August, 1959 with the heading: "How do you fancy this kind of phone? America has it now."

"Here is something new in telephones. Where? In private enterprise America. This new streamlined instrument—you push buttons instead of dialing—has been experimentally installed in a hundred homes in Connecticut and another hundred in Illinois. What are the advantages? Two principal ones, according to the engineers at the Bell company's New Jersey laboratories:

"(1) It takes only five seconds to push out a number compared with 10 seconds to dial it.

"(2) You make fewer mistakes by pushing than you do in dialing—and this is particularly important in America, where long-distance automatic telephone codes produce highly complicated numbers. For example, to call New York Information direct from New Haven, Conn., you dial 112-212-555-1212.

"The designers call this 'the telephone of the future.' They are confident that pushing will entirely replace dialing. But, even if those 200 families report favorably, the change will take several years. Push-buttons talk a rather different electronic language from dials, and so far, only the experimental exchanges in Connecticut and Illinois are equipped to interpret.

"In this country, the Post Office has no plans for push-button telephones. 'They would not work in our exchanges' was the official comment. The waiting list for telephones of any kind is still over 58,000 and of those who have telephones nearly a quarter are not even on the dial and may not be for another 11 years.

"Mr. Marples claims to be experimenting with telephone boxes which look prettier and smell sweeter, but he still has a long way to go before he matches the American enthusiasm for giving the customers service. It is perhaps significant that the first advertisement in the new Post Office campaign should show not human beings ringing each other up, but fish."

All we can add to this story is "Hurrah for private enterprise!"

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Since April, 1957, the Orange County Telephone Co. of Middletown, N. Y. has supplied hard hats (plastic safety helmets) for its outside construction and cable splicing forces. In 1957 also, penalties were negotiated in their union contract to insure use of the safety helmets.

On Apr. 14, 1959, this safety practice paid off for lineman Fred C. Roll when he started to hand up a crossarm to Warren Kerrigan who was working above him. Mr. Kerrigan made a move to put a heavy hammer in his belt, but it slipped from his grasp, falling 20 feet and striking Mr. Roll on the head. Mr. Roll's safety helmet was cracked by the blow, but he was not injured.

On Dec. 7, 1959, Roll was inducted into the "Turtle Club," an organization of those whose lives have been saved by the wearing of a plastic safety helmet. Charles C. Chappell, president of the Orange County Telephone Co., presented Mr. Roll with a framed certificate of membership in the club, as well as a wallet card and a lapel pin (see photo).

Mr. Roll has also received a new helmet bearing the insignia of the club, a turtle carrying a flag inscribed with the word "Safety." The sponsor of the club is E. W. Bullard of Sausalito, Cal., who is associated with the manufacturer of a line of yellow safety hats.

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Now that electronics plays such an important part in the field of communication, there is a definite need for a working knowledge of the cathode-ray oscilloscope. Many may consider this an extremely difficult instrument to use, but such is not the case if its principles are properly understood. The best book we have seen on this instrument is titled: "Encyclopedia on Cathode-Ray Oscilloscopes and their Uses," authored by John F. Rider and Seymour D. Uslan. This cloth-bound book of 1,396—8½ inch by 11 inch — pages may be purchased from TELEPHONY for $21.95. We are certain that it will prove a good investment for any modern telephone operating company.

The second edition of this book, now available, is a greatly expanded version of the extremely popular first edition. We do not know of any area of application of the CR oscilloscope which is not covered in this second edition. The authors have succeeded in serving the beginner as well as the experienced engineer.

The book treats both the elementary

Charles C. Chappell (second from right), president of the Orange County Telephone Co., presenting membership certificate in "Turtle Club" to Fred C. Roll (second from left).

and advanced concepts of the CR tube —the CR oscilloscope and its internal circuitry—as well as its myriad applications. Special emphasis has been given to make the CR oscilloscope understandable to all who have occasion to work with it. The explanations of the electrical organization of the device are very detailed, but not any less so than many of the chapters which are devoted to uses.

Certain chapters are devoted to information which is not to be found anywhere else, as for example, Chap. 22, which is devoted to square waveform testing of amplifiers, wherein the response curve which will produce indicated changes in the shape of the output signal is correlated. The amplifier response curve responsible for the change in waveform as well as the resultant waveform is illustrated.

Another chapter is devoted to the resultant of various combinations of sine waveforms over a range of amplitudes and phase relationships of the component frequencies.

Yet another chapter is devoted to the specifications of representative oscilloscopes which are presently available and to the schematics of these devices.

A major part of another chapter is devoted to oscilloscope maintenance.

A separate chapter is devoted to transmitter applications.

A chapter of more than 120 pages is devoted to scientific and engineering applications other than radio, audio, television and transmitters.

We are certain that this book will prove useful and a good investment to all personnel responsible for the installation and maintenance of repeaters, carrier systems, microwave and radio communication systems.

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Two different types of synthetic rope are now on the market which claim numerous advantages for line construction work.

GW polyethylene rope is about 1½ times as strong as Manila rope on a normal pull. Then, GW polypropylene rope is approximately 20 per cent stronger than polyethylene, with elasticity about the same. It has no moisture absorption, which indicates good dielectric properties (specific gravity—.90).

Polypropylene rope also has excellent abrasion and flexing resistance, and resists acids, alkalies and solvents. It is usually furnished in black for best ultraviolet protection.

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Crosstalk: The difference between gossip and news depends on whether you hear it or tell it.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. What is data transmission and how is it supposed to affect the telephone industry in future years?

A. According to one well-known authority, "data"—as used in communications—means numbers. Furthermore, numbers are the life blood of industry, and comprise a common language understood both by machines and men. Practically all information necessary to a business operation can be converted into numbers. In this form, information can be rapidly transmitted and manipulated.

Telephone industry leaders recently predicted that within 10 years the telephone companies of America may be transmitting more business data than voice signals; and that data transmission between business machines and computers could become the future's most widely used communication service.

•

Q. Can you advise us what causes "dancing aerial cable" and how it may be corrected?

A. Cable dancing has been experienced for some time at widely scattered locations throughout the country. Dancing usually occurs in sections subjected to high winds. Scattered trees or structures some distance from the aerial cable line may tend to set up turbulent air currents conducive to dancing. The most severe damage due to dancing is usually on lines carrying two cables, one on each end of cable suspension bolts.

Dancing damage on single cable has increased, however, in recent years as the result of increased use of cable construction in rural areas. When preventive measures are not taken promptly to reduce and limit dancing, strand and sheath failures due to fatigue or crystallization of lead cable are most certain to result.

One effective method of reducing or preventing cable dancing on double-cable lines is the installation of strand tie clamps in each span. These tie straps connecting the two strands should be located at the 1/4 and 2/3 points of each span. It is important that this spacing be as exact as possible or the benefit to the strand tie clamps will be reduced.

The method recommended for reducing or preventing dancing of single-lashed cable is the spiralling method. Two adjacent spans of cable are spiralled at one time by performing this operation at the middle pole. Remove the cable suspension clamp and by the use of an extra bolt twist the cable and strand until the length of the spirals in the shorter span is about 20 feet. Then reattach to the regular suspension clamp.

Spiralling tends to break up the uniform cross section of the lashed cable and the strand and to cause wind forces, responsible for dancing, to cancel out. Never ride spiralled cables in a cable car. Work on them should be performed from an extension ladder or a platform truck.

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Q. Now that rural power lines are using extra-long-span construction, is it desirable to string aerial telephone cables on the power poles?

A. The REA engineers contend that joint use of poles for power circuits and aerial cable is considered desirable in rural areas. In addition to construction economies, the long spans commonly used for rural power circuits reduce cable maintenance costs, because less bowing occurs than in short spans; and less sheath trouble results as most of this trouble occurs near poles.

REA has established a maximum of 60 per cent of the rated breaking strength of suspension strand as the limit to which the strand shall be stressed when the strand and cable it supports are loaded with ice and wind in accordance with the National Electrical Safety Code (NESC) storm loading assumptions.

If these and other necessary precautions are observed, it is the general opinion that jointly used poles on long-span construction will prove to be satisfactory.

Wheatstone Bridge Measurements

By JOHN A. BRACKEN

Part 7

WHEN a faulty cable pair consists of a combination of different size wires connected in series, to determine the location of the fault, it will be convenient to convert the cables comprising the combination to an equivalent length. This will usually consider the longest section by multiplying the actual length of each section by the appropriate factor taken from *Table 1*.

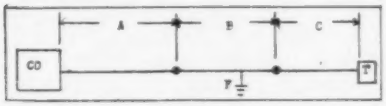


Fig. 1

Example: In *Fig. 1*, section "A" consists of 2,345 feet of 24-gauge cable, section "B," 3,123 feet of 22-gauge, and section "C," 3,678 feet of 19-gauge. The 19-gauge cable being the longest, all sections "A" to "C" may be converted to an equivalent length of the 19-gauge as follows:

(1) In *Table 1*, under the heading "AWG" copper wire, locate number 19. To the right, under the heading "19" is the multiplying factor 1.000.

(2) Under the AWG heading, locate the number 22. To the right under the heading "19" is the factor 2.005.

(3) Under the AWG heading, locate the number 24. To the right under the heading 19, is the factor 3.188.

(4) Multiply the length of each cable section by the associated equivalent length conversion factor.

Thus: $1.000 \times 3678 = 3{,}678$
$2.000 \times 3123 = 6{,}262$
$3.188 \times 2345 = 7{,}476$

17,416 equivalent feet of 19-gauge cable.

Suppose the result of a three Varley measurement indicates the fault "F" in *Fig. 1* to be 4,254 equivalent feet from the cable terminal "T". Of this 4,254 equivalent feet, 3,678 actual feet of the 19-gauge cable are in section "C", consequently the true location of the fault "F" is $4{,}254 - 3{,}678 = 576$ feet from the junction of section "B" and "C" in the 22-gauge cable.

When trouble is in branch cables extending from a main cable and a bridge measurement shows the fault to be located at a multiple splice, the trouble may be either at the splice or in the branch cable.

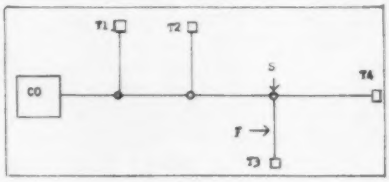


Fig. 2

For example, if a measurement of the fault at point "F" in *Fig. 2* is made with the good and bad cable conductors strapped together at terminal "T4", the fault would appear to be at the multiple splice "S". To determine whether the fault is at "S", or somewhere in the branch cable, it is necessary to remove the strap at "T4" and place it at "T3" and make another measurement. If the fault is in the branch cable, it will be indicated in this second measurement. However, if the fault is in the multiple splice "S", that fact will be indicated by both measurements showing the fault to be at "S."

In determining the location of faults in loaded cables, the resistance of the loading coils, and the resistance of the conductors in the loading coil stub cable, must be subtracted from the three Varley measurements. Whenever a break occurs in a cable conductor, it is called an "open", and for the purpose of locating such faults a new set of conditions must be considered.

For example, all telephone line conductors act as capacitors. The conductors form the plates, with the air (in the case of open wire) and the insulating material (in the case of a cable conductor), serving as the dielectric.

Increasing the length of an open wire line or a cable increases the area of the "plates" formed by the respective conductors. Consequently, the capacitance of the circuit increases as its

AWG Copper Wire Size	Cable Equivalent Length Conversion Table — Multiplying Factors				
	19	22	24	26	28
19	1.000	0.497	0.314	0.197	0.122
22	2.005	1.000	0.628	0.395	0.248
24	3.188	1.589	1.000	0.628	0.396
26	5.068	2.527	1.589	1.000	0.629
28	8.064	4.013	2.528	1.589	1.000

Table 1

length is increased. Due to the fact that cable conductors possess capacitance, Wheatstone Bridge tests for the purpose of locating an open are essentially capacitance tests. *Fig. 3* shows a Murray Loop open location test arrangement, a source of low frequency alternating current being substituted for the Wheatstone Bridge battery and a head receiver for the galvanometer.

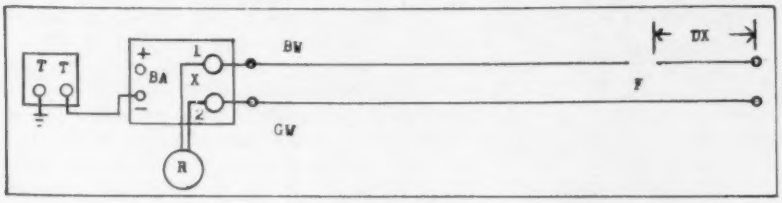


Fig. 3

Two measures are required, one at each end of the portion of "cable" involved, called first and second measurement, as follows:

(1) Clear the faulty cable pair at both ends.

(2) Connect the bad conductor (BW) to the Wheatstone Bridge post "XI".

(3) Connect the good conductor (GW) to the bridge post "X2".

(4) Connect head receiver across the bridge "XI," and "X2" posts.

(5) Disconnect the battery from the bridge "BA" binding posts.

(6) Connect one pole of the source of alternating current to the bridge "BA" post and the other pole to ground. The source of the alternating current may be obtained from the steady tone of a cable splicers' tone set, or from an ordinary buzzer arranged as in *Fig. 5*, where "C" "C" are 0.1 microfarad capacitors, "RH" rheostat for controlling buzzer tone output, and "SW" switch for starting and stopping the tone.

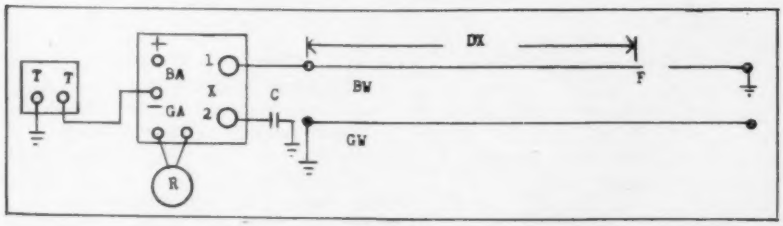


Fig. 4

(7) Operate the bridge "BA" turn button switch to the "OUT" position.

(8) Set the ratio dial at M 1000.

(9) Operate the cam lever switch to the "MUR" position.

(10) Start the tone and balance the bridge by rotating the rheostat dials while listening in on the head receiver. A balance is indicated by an absence of tone in the head receiver, or until a minimum of tone is heard—call the measurement R1. Move bridge to the distant end of the cable and repeat the test, call the measurement "R2." Then by formula: DX = (R1 L) ÷ R1 + R2, where DX = distance to the fault from point of the first measurement.

R1 = first measurement.

R2 = second measurement.

L = Total length in feet of portion of cable tested.

Example: Two measurements were made, assume reading R1 = 81 ohms and R2 = 890 ohms, and the cable length tested 129 feet, then DX = (R1 L) ÷ R1 + R2 or, 81 × 129 ÷ 81 + 890 = 10.8 feet.

Fig. 4, shows another open location test and is performed by comparing the capacitance of the open cable conductor with an ordinary capacitor as follows:

(1) Clear the faulty cable pair at both ends.

(2) Connect the open conductor (BW) to the bridge "X1" post.

(3) Connect one terminal of a one microfarad capacitor to the bridge "X2" post and the other terminal to ground.

(4) At point of test, connect the good conductor (GW) to ground.

(5) Connect head receiver to the bridge "GA" posts, and operate the "GA" turn button switch to the OUT position.

(6) Proceed as outlined in items 5, 6, 7, 8, 9, and 10 above.

(7) Disconnect the open conductor "BW" from the bridge post "X1" and connect it to ground at point of test—distant end to remain grounded.

(8) Disconnect the good conductor (GW) from ground and connect it to the bridge "XI" post. The 1MF capacitor remains connected as is.

(9) Balance bridge as previously described, call the measurement R2. By formula: DX = (R1 L) ÷ R2.

Example: Again, two measurements were made, assuming readings of R1 = 70 ohms and R2 = 99 ohms and cable length 3,652 feet. Then DX = (R1 L) ÷ R2 or, 70 × 3,652 ÷ 99 = 2,583 feet.

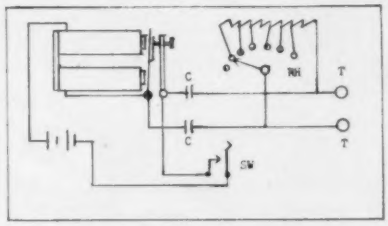


Fig. 5

In making telephone line fault location measurements, it should be borne in mind that such variable factors as temperature variation, high resistance connections, foreign EMF, stray earth currents, electrolytic action at the fault itself, induction, etc., all contribute to making exact measurements more difficult. However by careful analysis of the nature of the fault, with a thorough knowledge of the outside plant conditions throughout the territory involved, and systematically applying the experience obtained by practice, a close degree of accuracy in the result of Wheatstone Bridge measurements may be acquired.

(The End)

Purchasing Power of Dollar Is Lowest in History

The American dollar is worth less today than at any time in history; less than when the Constitution was adopted, the Chamber of Commerce of the United States reports.

In the 20th Century, within the lifetime of many persons still working, the purchasing power of the dollar has dropped from 100 cents to less than 29 cents the chamber states. The value of savings, pensions, and insurance has dropped accordingly.

The chief cause of inflation, the national chamber opines, is excessive, deficit spending by the federal government.

To check this type of spending, the chamber is calling on Congress, this session, to keep the highway program on a pay-as-you-go basis; to oppose inflationary increases in the minimum wage; to remove artificial restrictions on the interest rate of government bonds; to avoid wasteful defense spending; and to eliminate unnecessary spending for public works, depressed areas, community facilities, veterans' benefits, and airport construction.

Need Adequate Rates to Serve, South Dakotans Told

By L. J. Armentrout*

INFLATION HAS placed a burden on regulatory commissions giving them the responsibility of seeing that telephone company rates are adequate enough to provide good service, C. L. Doherty, commissioner of the South Dakota Public Utilities Commission brought out at the South Dakota Telephone Association convention.

K. P. Ellefson, of Dell Rapids, vice president, presided. President J. W. Tobin of Plankinton was at a meeting of the Governor's Tax Investigation Committee.

Speaking at the association's 55th annual meeting, held in Huron on Nov. 18 and 19, Commissioner Doherty said, "Many of the commissions in the United States, perhaps, have been a little slow in recognizing this, but I believe that they are alerted to the fact now, and realize and appreciate your problems and know that telephones are not necessarily cheap.

"They also know that good service costs money. The common man in the United States today lives in a world of magic, with a turn of his wrist he can fill a glass of water, pure and life preserving, a precious commodity in many parts of the world. He flips a switch, and commands illumination and power beyond the wildest dreams of his grandfather. He picks up a telephone and in conversational tones makes himself heard next door, across the nation, or around the world, and privately, too.

Wide-Spread Blessings

"Looking at the statistics you can see how wide-spread are these blessings. For instance, there is a telephone in seven out of every 10 households, whether crowded together as apartments, or far apart in the remote and lonely countryside. . . .

"Now these facilities do not just fall into the customers' laps with the greatest of ease. The last 10 or 15 years have shown most dramatically how complex and gigantic is the endeavor that provides them. These years have shown how big is the task of regulating these enterprises so that the customer is protected as well as served. This same regulation must consider the interest also of the workers in these industries and of the stockholders who invest their savings in utilities. The demand has grown so fast in the present ever expanding economy, that the public has entrusted millions of dollars to the various utility companies, for new equipment and property so that they could satisfy the appetite of the average consumer, who clamors for utilities service he did not previously enjoy. . . . The hike in income of the average worker has sky-rocketed and increased many times. Naturally, this has sharpened the appetite for utility service and, applying to your industry, increased the demand for more telephone service. . . .

"At the turn of the century, with the nation having a population of 75 million, the total number of telephones in the country was about 800,000.

"Today, as you know, the number of telephones is about 67 million. Five years ago, President Eisenhower was presented with the 50 millionth telephone so you can readily see the phenomenal growth and development in your field. Conversion to dial operations is exceedingly rapid. Within seven years, all Independent telephone companies could be dial operated. Eighty per cent of Independent company telephones are already dial."

Excise Tax Progress

Turning to the problem of excise taxes, Commissioner Doherty felt that definite progress had been made by setting a July 1, 1960, termination date on local service telephone taxes.

He continued:

"Disappointing thought it was that outright immediate repeal of taxes on both local and long distance service could not be obtained, it was understandable on sound fiscal grounds why Congress did not do more. It was faced with a 12-billion-dollar deficit, and repeal of the excises on our business would have increased the deficit 700 million dollars. Repeal of the tax on local service alone would come to about 325 million dollars."

Also speaking on tax matters were Bruce D. Gillis, South Dakota commissioner of revenue and his assistant D. E. Misfeldt, utilities valuation engineer.

Mr. Gillis reviewed a recent assessors' school held in Yankton at which 158 persons registered. He stated he was very much impressed with the interest shown by these men who are determined to come up with a good state tax equilization program.

He added that a panel of utilities, consisting of telephone companies, railroads and gas and power companies was very impressive and was one of the most interesting phases of the program.

Mr. Misfeldt, among other things, thanked the telephone men for the fine cooperation shown by utilities in developing ratio studies over the past two years. He invited companies to feel free to come to his department any time for help with tax matters.

Representing an agency of the federal government, George L. Streukens of the Rural Electrification Administration Telephone Operation Loans Division, Washington, D. C., explained the recent reorganization of the telephone division.

In discussing the five general regions, Mr. Streukens pointed out there is no such thing as R.T.A. The correct terminology for the group that he represents is "Telephone Loans Division of the R.E.A."

Mr. Streukens said that in this regional setup each region is equipped to process loans from original application to the final authority of requesting a check from the Treasury Department to the borrower.

Highway Program

Speaking on the national and state highway program, M. W. Clarkson, commissioner of the South Dakota Department of Highways, reported that the program has been cut almost 50 per cent due to lack of funds.

He pointed out that district highway engineers could inform utilities in advance of highway routings, so plans could be made for relocation of pole lines.

Highways and driving in general were given a close look by L. E. Evans, safety supervisor, Northwestern Bell Telephone Co., Sioux Falls, who spoke about defensive driving.

He said, "I am here today to talk about one of the most serious problems facing the American public today—a problem that is as serious as a threat

*Mr. Armentrout is secretary-treasurer of the South Dakota Telephone Association.

to the lives of our young people and to the economy of our country as an act of aggression by a foreign power.

"And, yet, very few people are concerned about it—in fact, it's accepted as 'inevitable' by a very high majority of the people—'the price of progress' some call it—'fate'—'unlucky break' by others. . . . I'm speaking of the problem of safety on our streets and highways.

"Last year in the United States more than 37,000 people gave up their lives in motor vehicles. . . . There have been more people fatally injured as a result of motor vehicle accidents since 1900 than there have been deaths in all of our wars combined."

Rules For Professional Driving

He pointed out that it is possible to drive without an accident if effort to do so is put forth—17 per cent of drivers do. They are what should be called the "pros"—the other 83 per cent are average or below.

He also gave the following rules for reducing accidents:

(1) "Don't drink and drive. It was stated in a recent National Safety Council article that 'alcohol is the largest single factor in our motor car accident situation; it is equal to all other causes combined.' And, this does not mean just the 'drunk drivers.' The 'social drinker' may have his ability impaired by only one or two.

(2) "Good physical condition—especially vision—you have to see to drive.

(3) "Obey traffic laws. They are generally made for our safety and the safety of others on the highway.

(4) "Do not depend on right of way.

(5) "Let other drivers know what your plans are—as a matter of courtesy if for no other reason—but don't get yourself trapped if the other driver isn't as courteous as you are. One other thing—'two wrongs don't make a right.'

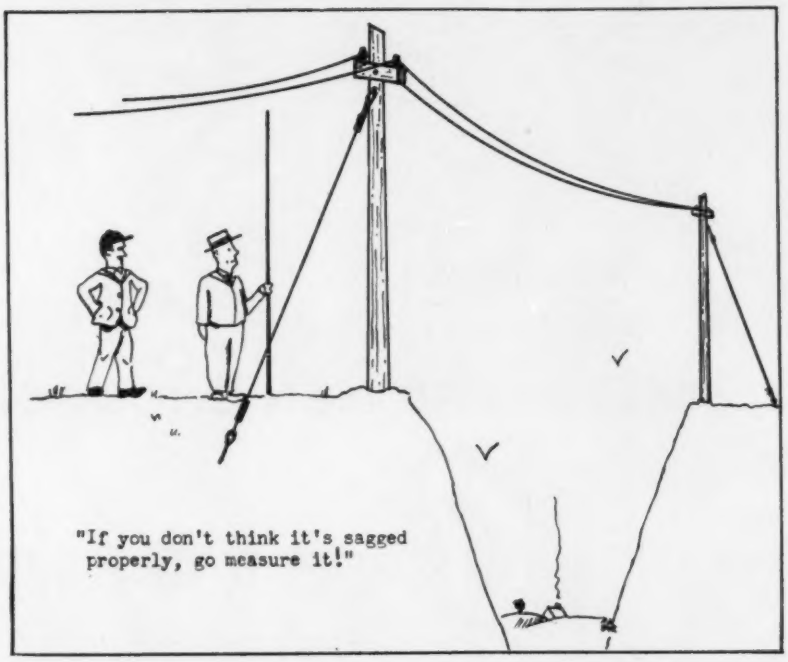
(6) "There are two continuing requirements — space and vision. The more of each we have, the better driving job we can do."

Panel Reviews Trends

Also on the program was a question and answer panel. Panel members were: Frank Dixon, Northwestern Bell Telephone Co., moderator; J. W. Pfaender, New Ulm, Minn.; L. J. Armentrout, Armour; R. E. Bennett, Sioux Falls; and Ralph Winstead, REA field representative, Mitchell.

Items covered by the panel included:

(1) Regional Directories: Mr. Dixon explained the scope of the regional directory theory, pointing out that the ultimate impact of DDD would make it almost imperative that consolidated directories be used for furnishing good service to the public. The effect of regional directories would be felt by all telephone companies in that it would speed up overall service and stimulate more toll.



Mr. Dixon pointed out that, while this was a rather new venture in South Dakota, there has been good acceptance of regional directories in other areas of the United States.

Mr. Pfaender indicated he was aware of areas in Illinois, where there were many urban developments with various central office exchanges where the combined regional directory was a boon to many telephone users.

(2) Buried Plant: Considerable discussion was centered around buried rural plant. Again, Mr. Dixon reviewed the experiences of the Northwestern Bell company with this type of construction, his opinion being that the economies of this type of construction, which included original engineering, power interference, improved right of way appearance, tree conditions, etc., could mean only a better all around method of providing service to the rural areas.

(3) Easy Number Calling: A question directed to the panel concerning this new phase of the 2-5 numbering program was answered by R. E. Bennett as follows:

"The original plan for seven digit dialing entailed the use of two letters prior to five numerals. The need for more central office designations prompted the addition of a plan for using all numerals for this seven digit dialing.

"About the middle of this year this new plan was called ANN (All Numeral Numbers); since that time this code has been changed to ENC (Easy Number Calling).

"In developing and accepting this plan, it was brought out that there are about 540 practicable combinations with two letters, derived from central office names, and five numerals—and over 720 with all numerals.

"Also, controlled usage tests have shown that all numeral numbers can be dialed faster and more accurately.

"Other advantages are that the numbers eliminate the confusion between the letter 'O' and the figure ZERO and the letter 'I' and the figure ONE.

"ENC will also do away with objections customers sometimes have towards central office names and misunderstandings as to the way lettered central office names are spelled or pronounced.

"In addition, numbers can be read and understood all over the world."

Mr. Bennett pointed out the ENC system will fit in well with plans for international dialing of calls.

Directors for the coming year are: K. P. Ellefson of Dell Rapids, J. W. Tobin of Plankinton, Kenneth Connors of Jefferson, Lloyd Johnstone of Kennebec, R. G. Price of Highmore, Les Jensen of Hot Springs, Clell Elwood of Custer, Kenneth Hauge of Alexandria and J. P. Holland of Sioux Falls.

Officers are: President, Mr. Ellefson; Vice President, Mr. Tobin and Secretary-Treasurer, L. J. Armentrout of Armour.

in the southwest

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NORTH, SOUTH, EAST or WEST, Strowger is best! You can prove this for yourself. Just visit a Strowger exchange and ask the owners if they're satisfied with their dial equipment. Then, get in touch with us. We'll be glad to help you plan for your next dial conversion. Just write Automatic Electric Sales Corporation, Northlake, Illinois, or call Fillmore 5-7111.

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THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

"HOW AM I doing?" This thought is in the minds of all employes who are sincerely interested in their jobs, not only during their initial and follow-up training periods, but during their entire service periods, as well.

Many methods have been devised in the telephone industry, as well as in other industries, to evaluate the employe's work and progress.

One insurance company has an excellent formula for annually rating the work of its employes. The employes look forward to this procedure as it enables them to determine what kind of a job they have been doing in the preceding year, according to their company, and enables the individual to work on those items which did not receive a favorable rating.

In rating employes, the insurance company uses the following classification system:

(a) Outstanding
(b) Superior
(c) Good
(d) Acceptable
(e) Sub-standard

Ratings, made by the person in charge of the department, are on the following items:

(1) Quantity of work
(2) Quality of work
(3) Dependability
(4) Cooperation
(5) Office conduct
(6) Job attitude
(7) Knowledge of work
(8) Judgment
(9) Adaptability
(10) Initiative
(11) Business contacts
(12) Decisiveness
(13) Mental alertness
(14) Ability to communicate
(15) Emotional stability
(16) Resourcefulness
(17) Supervisory ability
(For those in supervisory positions only.)

The person in charge of the department acquaints the employe with his or her rating, and the employe has an opportunity to discuss, with the department head, any problems they may be encountering.

In the traffic department of the telephone industry we stress, "Courtesy, Accuracy and Speed." All three are essential in rendering pleasing and satisfactory service to telephone subscribers. Subscriber contacts become more and more important as they become less frequent due to the increased mechanization of the handling of telephone calls.

While the three essentials of good service, courtesy, accuracy and speed, are of primary importance, there are many other things which are also essential in rendering satisfactory and pleasing telephone service.

Item 3, is an example—dependability. If an operator performs excellent work when she is on the job, but her attendance record is unsatisfactory, she is a contributing factor in making it more difficult to render good service to telephone customers.

If an operator is capable of doing a good job, but her attitude towards her work keeps her in an unhappy frame of mind, she is very likely to perform her work unsatisfactorily.

Adaptability is important in performing any type of work, as well as in our personal lives. The person who becomes upset when she is assigned to a different type of job lacks adaptability. This type wishes to follow a certain pattern and change makes her unhappy.

Some individuals are so sensitive that if it is necessary to point out that a prescribed routine is not being followed, etc., they become emotional, upset, and unhappy. Such individuals lack emotional stability.

In any line of work, including the telephone industry, employes must be able to exert initiative, when necessary. There are always times when there is no specific rule to follow and we must use our own initiative.

When we are on the job, we must be mentally alert at all times. Daydreaming has no place in business. We must concentrate on what we are doing in order to do a good job.

During business hours, our full time and attention should be given to the job at hand, because we are being paid for this time by our employer. There is a time for work and there is a time for play and we would resent having our employer interfere with our play time. According to the same rule, the employer has a right to expect that we be mentally alert while on the job and give our time and attention to it exclusively.

In addition to job evaluation procedures, every individual is wise to ask himself occasionally, "How am I doing?" both workwise and in his personal life.

If he does, he will probably have a happier and more satisfying life off, and, on the job.

Traffic Questions

(1) How many numerals do most telephone numbers in Anchorage, Alaska consist of?

(2) Will Alaska become part of the dialing network within the continental United States and Canada?

(3) What code has been assigned to Alaska?

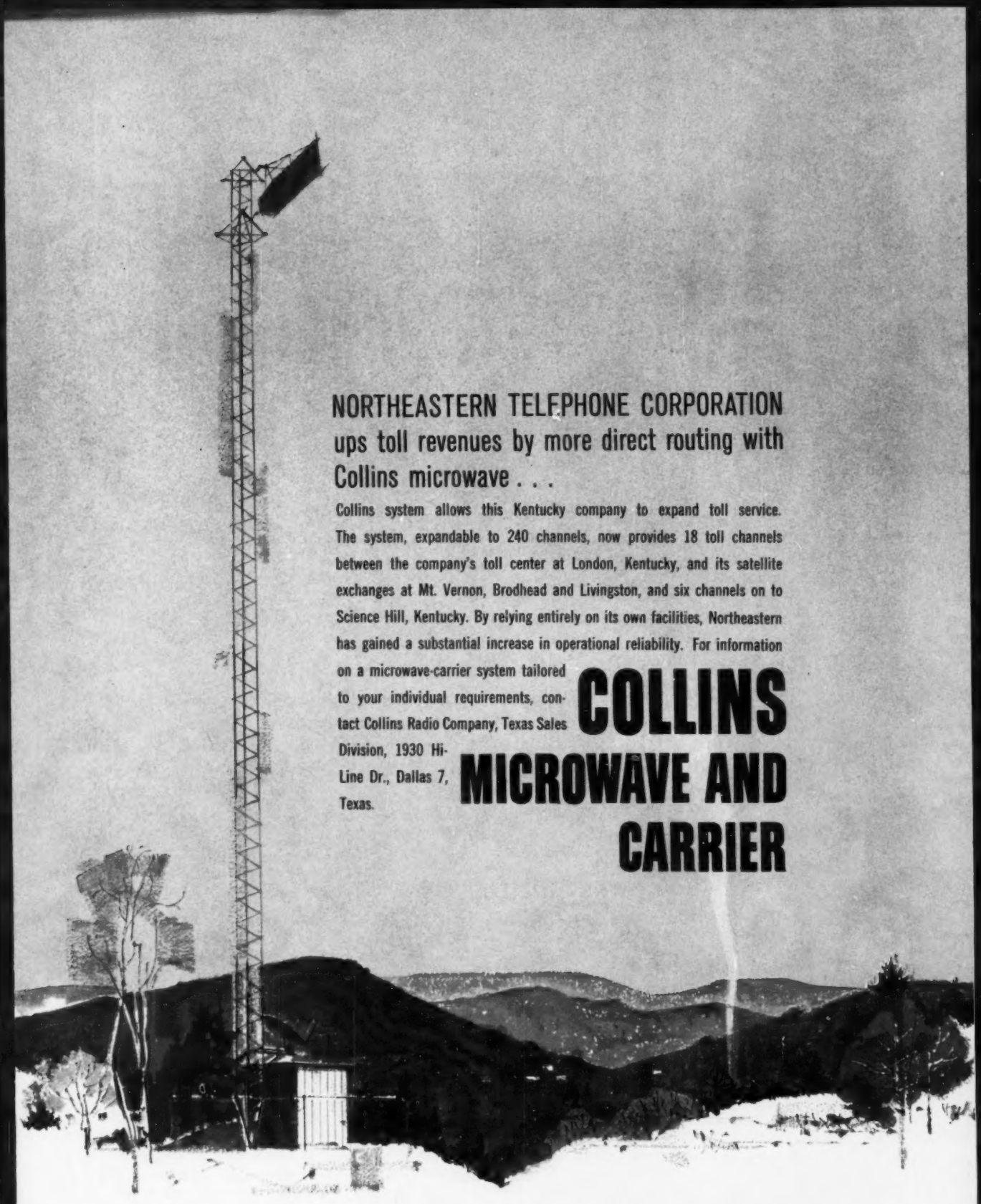
(4) How many numerals do most telephone numbers in Fairbanks, Alaska consist of?

(5) How will Alaskan operators reach telephones in the other 49 states and Canada on southbound calls?

(Answers to questions are on page 53)

Gauge of Verbal Value

"Words indeed are but the signs and counters of knowledge, and their currency should be strictly regulated by the capital which they represent."—COLTON.



NORTHEASTERN TELEPHONE CORPORATION ups toll revenues by more direct routing with Collins microwave . . .

Collins system allows this Kentucky company to expand toll service. The system, expandable to 240 channels, now provides 18 toll channels between the company's toll center at London, Kentucky, and its satellite exchanges at Mt. Vernon, Brodhead and Livingston, and six channels on to Science Hill, Kentucky. By relying entirely on its own facilities, Northeastern has gained a substantial increase in operational reliability. For information on a microwave-carrier system tailored to your individual requirements, contact Collins Radio Company, Texas Sales Division, 1930 Hi-Line Dr., Dallas 7, Texas.

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T.O.P.* TOPICS

By WINNIE B. BURNETT

Part 5
Simplify Your Clerical Chores

(Previous Articles in Dec. 5, Dec. 12, Dec. 26 and Jan. 9 issues.)

MANY chief operators and office managers feel somewhat like the old lady who lived in a shoe. They have so many clerical chores they don't know what to do. However, the *thinking* chief can well say, "I have many clerical chores, but I *know* what to do—*organize!*"

In the highly competitive business world of today, organization is a critical factor. Planned organization provides effective management and smooths operating procedures. Management control is inexorably tied up with planning —advance planning. Decide in advance what should be accomplished, when it must be done, how to do it and where to send or file the records after it is done.

If you are so burdened with clerical chores that you wish you were twins, if you sometimes wonder if the only thing the general office does is dream up new time-consuming reports "to keep you busy," you are most emphatically wrong.

Every report you keep is valuable and in some way affects the standard of office you supervise. The peg count measures the number of persons required to handle traffic offered by the customers at a given period, as well as determining the type of equipment needed to render the grade of service the customer deserves and demands. And, doesn't an accurately figured time report keep the respect of your employes? Certainly if errors or oversights are constantly causing delayed payment, you will eventually "lose face" with your employes.

One of the important skills required by a manager is organization. How well organized are you? If you unexpectedly had to be away from the office at a "crucial" time (deadline for important report), or experienced the misfortune of a long illness, could your subordinates handle your job with little confusion? As office records and activities become increasingly complex, management needs a detailed instrument panel to keep from flying blind.

An efficient and systematic manner of listing duties and responsibilities has recently been introduced to the secretaries and stenographers of our company. This is known as the Job Plan. Such a plan would be beneficial and could be applied to any type of job, equally well to your clerical duties. In order to have a correct and effective job plan, a definite pattern must be followed, regardless of the job. The following outline shows the manner in which your job should be broken down.

JOB PLAN

Name..... Position..... Dep't.....

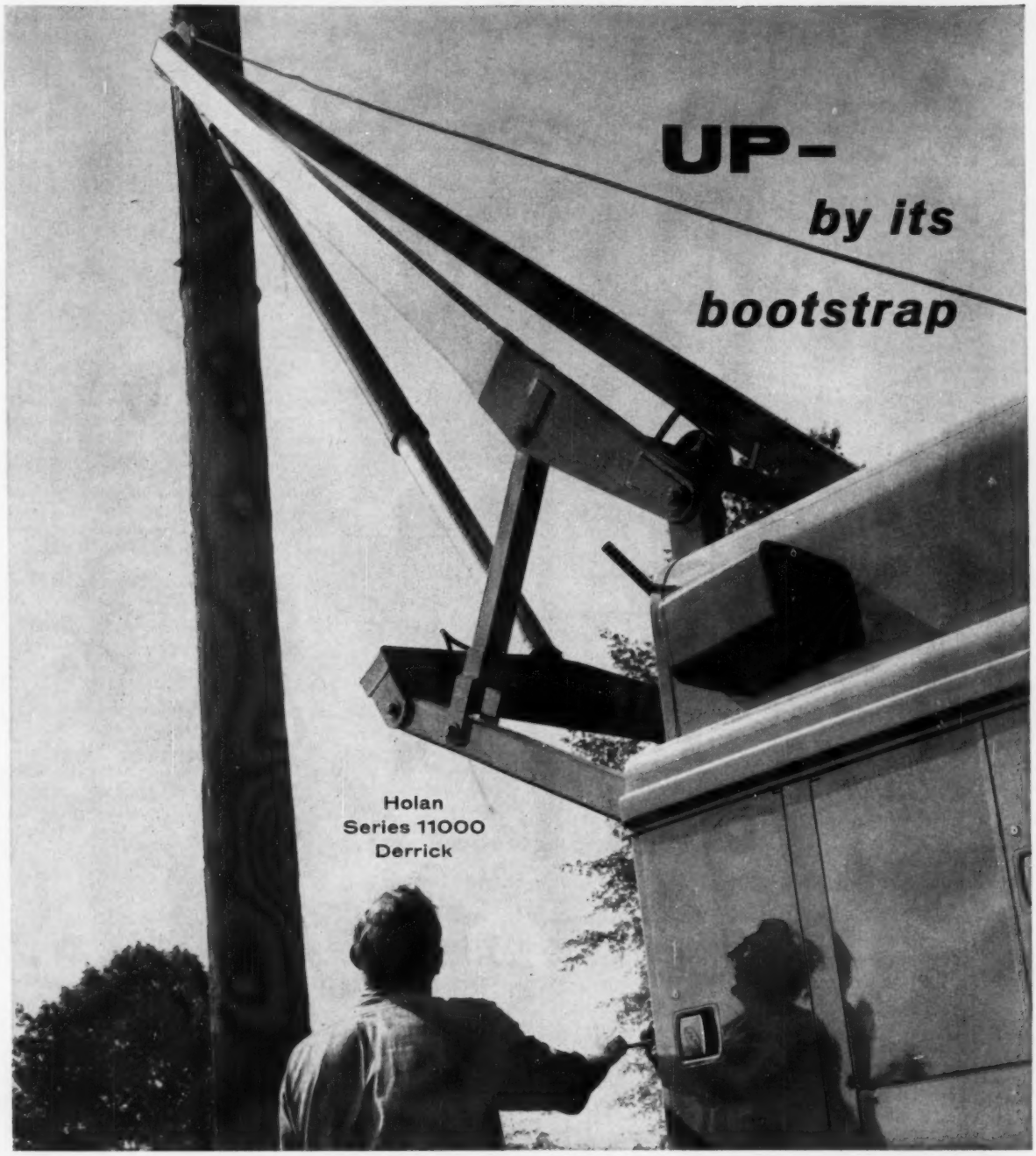
(A) DATE (WHEN)	(B) DUTIES (WHAT)	(C) INSTRUCTIONS (HOW)	(D) DISPOSITION (WHERE)

(A) DATE—*When* it is to be done. Arrange your DUTIES in the order they are to be performed, as:

(a) Special (at once).
(b) Hourly.

(Continued on page 48)

*Traffic Operating Practice.



Secret of this single-cylinder derrick is its bootstrap linkage. This unique design feature lowers the cost of this new Holan derrick without lowering the quality.

One rugged hydraulic cylinder—controlled by a single lever—will lift a load of 8,000 pounds, set 60-foot poles, body load 2,000 pounds and lower the derrick to within two feet of the ground.

The Holan Series 11000 Derrick is a fully live boom derrick with two rectangular shaped side legs—fabricated from high tensile steel—pivoted about a rear post with a hydraulic cylinder leg.

Here is a derrick you will want to investigate. Call your Holan Field Representative—or write us for complete details.

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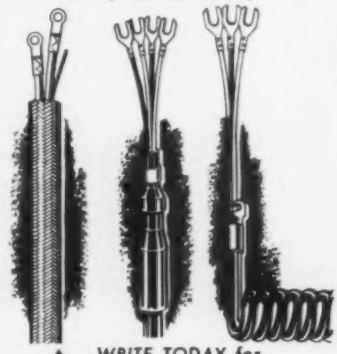
Patch cords, transmitter cords, test and inter-communication cords are all quickly available from COMCO, and cords made to your exact specifications require little more than an immediate delivery schedule. Determining the exact time required for delivery of your problem cord takes only a call to COMCO. Why not make it today?



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New Development for Computer Technology

Computer technology has been significantly advanced by development of a new, accurate and fast electronic memory, Western Electric and Bell Telephone Laboratories reported on Jan. 8.

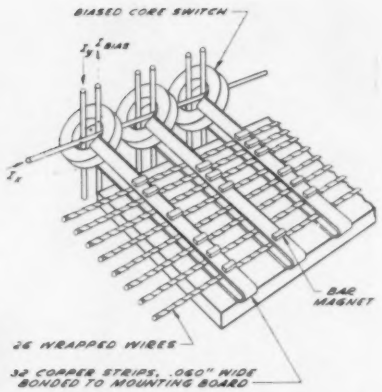
Hair-thin wires wrapped with magnetic metal tape in barber-pole fashion plus tiny bar magnets are the basic elements of the permanent electronic memory which is comparatively inexpensive, easy to produce, and will help speed up computer developments. The memory will supply bits of information at speeds in millionths of a second to a computer.

H. L. Stadler and D. G. Clemons, Bell Telephone Laboratories, discuss basic components of the Magnet-Twistor memory module, just announced by Western Electric and Bell Laboratories. A partially assembled module is in the foreground, with a completed unit behind it.

Only 14 months elapsed between the decision to use the memory and its readiness for mass production. This was accomplished through the closely coordinated research-engineering work of Bell Laboratories and Western Electric.

A typical memory unit is built up of alternating grids of magnetic wire strands called "Twistors" and plastic cards with arrays of minute bar magnets.

The Twistor is a thin, hair-like copper wire, around which is spirally wrapped a magnetic tape one-tenth of the thickness of the wire itself. The magnet array is formed by bonding a thin sheet of magnetic material to a plastic card and then removing all undesired magnetic material by precise photoetching methods. The finished card stores information in much the same way as a punched card in an office calculator or computer.



A section of a Twistor-Magnet memory frame. Three cores of the biased core switch or transformer and their word coils or solenoids are shown, with eight intersecting twistors. The bar magnets are shown as tiny "blocks" on the word coils. (For reasons of simplicity, the plastic tapes supporting the Twistor wires and the word coils have been eliminated in this drawing, as has the plastic card carrying the bar magnets.)

In a punched card, information is stored by the presence or absence of a hole. Similarly, the new Magnet-Twistor memory retains information by the presence or absence of a bar magnet at a specific location on the plastic card.

When a punched card is inserted into a calculator, an electric current flows where the card is punched and does not where there is no hole, providing information to the calculator. When a Magnet-Twistor memory card is read by a computer, an electric pulse is transmitted if there is no magnet or blocked if there is a magnet present.

These electric pulses represent commands to the computer, telling it how to proceed in solving problems with accuracy and extreme speed of operation.

Deaf Attorney Develops Telephone Technique

A totally deaf Corpus Christi, Tex. lawyer has perfected a system which enables him to carry on a telephone conversation.

William F. Wallace Jr. is using this technique in practicing his profession, and he feels it may be valuable to other people with hearing difficulties who are engaged in business.

With this method, Mr. Wallace's secretary, Mrs. Margo Salinas, has another telephone on the same line. She dials the number and tells the party who is calling. At a nod from her, Wallace picks up the receiver.

She is seated facing him, his eyes are on her lips. As the party on the other end of the line talks, she repeats his words.

Wallace reads Mrs. Salinas' lips. He then answers the other party. He uses the same technique at home, enlisting the aid of his wife.

The telephone used by his assistant is equipped with a button which keeps the sound of her voice (even though only a whisper is needed for lip-reading) from being heard by the other party.

Mr. Wallace got the idea when he saw a court reporter repeating the words of witnesses into the microphone of a tape recorder.

He described his telephone system in an article published by the American Medical Association.

Besides being an attorney, Mr. Wallace is president of an oil company, an insurance agency and an investment company.

IN THE NATION'S CAPITAL

Continued from page 21

the chief investigator for the House Sub-committee on Legislative Oversight lost his job because of public disclosure that he had planted a bug in the Washington hotel room of one important witness in the celebrated Sherman Adams incident.

The plain inference is that, when the stakes are high enough, even government officials will use modern technical equipment to gather necessary information or evidence—any statutory laws on the books to the contrary. A telephone company's obligation stops when it sees, to the best of its ability, that such equipment is not connected to any telephone wires or other facilities (unless it is official and the proper kind which gives out a "beep" every so often to warn the telephone user that his call is being recorded). Can you imagine that the Internal Revenue Service use anything like a "beep" recorder when it is riding herd on a potential tax defaulter?

Minnesota Rural Co-op Seeks Dial Rates

The rate application of the Paul Bunyan Rural Telephone Cooperative, Bemidji, was to have been heard by the Minnesota Railroad and Warehouse Commission on Jan. 7.

New rates were asked by the company in connection with cut-over to dial operation at several of the cooperative's exchanges. The changeover is expected to be completed by the end of 1960.

Exchanges affected are Northome, Kelliher, Ranger, Turtle River, Max, Mizpah, and Solway.

Educational Balance

"We must exercise care to have a proper balance between the humanities, the professional areas, the social sciences, and the physical and natural sciences. We must never allow an overemphasis on any of these areas of scholarship."—GLENN T. SEABORG, *chancellor, Berkeley Campus, University of California.*

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Courts and Commissions

In Informal Talks MST&T Proposes Lower N. M. Rates

The New Mexico State Corporation Commission on Jan. 7 in an informal meeting with officials of the Mountain States Telephone & Telegraph Co., discussed a reduction in the company's telephone rates for New Mexico. Commissioners Fails and Block favored this negotiations method; Chairman Pickett opposed.

Earlier, Charles Boatwright, New Mexico's director of public utility operations, had recommended a reduction of $452,000 in the MST&T rates. He said this would leave the company a rate of return of 6.25 per cent, compared with 6.7 per cent earned in 1958. In 1954, the commission established 5.91 per cent as the proper rate of earning for the company on its New Mexico investment.

Company officials proposed during this early January meeting to reduce various rates by a total of $302,200, or two-thirds of the cut which the commission had recommended.

Attorney Harry Bigbee, presenting Mountain States' case, emphasized that the company was not making its offer to reduce charges because it conceded rates were too high, but because it did not wish to shift personnel from operations to preparation of a rate case whose cost would ultimately have to be passed on to the subscribers.

Mr. Bigbee also said that the company's earnings were below the 5.91 per cent allowed by the commission in 1954 (excluding advertising revenue) for subsequent years. He argued that allowable earnings should exceed 6 per cent, but said to the commission, "We'll agree to meet you half way and try to keep our incentive program going. If it becomes impossible, we'll have to come back. We might be stretching it too far, but we'll try."

The attorney said further that Mountain States was offering reductions "because we know that, faced with a rate hearing, it would take our people away from operations and it would cost a lot more than that to the public and the telephone company in loss of efficiency."

Earl Louthan, Mountain States vice president, said reductions were figured on anticipated 1960 business but the projected per cent of earnings with the cuts could not be calculated because the business is highly volatile.

In a prepared statement released at the informal Jan. 7 meeting, Mr. Louthan said, "We're facing the biggest job we have ever undertaken in New Mexico with a 1960 construction program calling for an expenditure of twenty million dollars.

"Although we do not feel that a reduction in revenues is justified, we make this proposal with the hope that continued growth will offset the revenue loss. Our earnings are far less than for other successful businesses."

Ga. Company Gets OK To Amend Financing Order

The Consolidated Telephone Co., Moultrie, on Jan. 8 was given permission by the Georgia Public Service Commission to amend the commission's Aug. 6 order regarding the issue of debentures (TELEPHONY, Sept. 19).

In the commission's August order, the company was allowed to issue certain 6 per cent subordinated debentures which would be convertible into common stock at a price based on the sound book value of the common stock at the time of conversion.

In the current order, the PSC approved the company's request to delete the common stock convertibility provision of the debentures.

New Jersey Company Gets Approval for Increase

The United Telephone Co. of New Jersey, Newton, has received approval from the New Jersey Department of Public Utilities for a rate increase to 13,000 subscribers in Sussex County.

The increase, expected to go into effect in February, will give the company about $135,000 additional annual income. United had asked for $236,000.

Set Ill. Hearing on Raise

The Illinois Commerce Commission scheduled a hearing for Jan. 20 on the application of the National Trail Telephone Co. for an increase in all its exchanges in Illinois.

La. High Court Orders PSC To Allow Increased Bell Rates

The Louisiana Public Service Commission on Jan. 11 was ordered by the Louisiana Supreme Court to take appropriate measures to grant additional increases in the rates and charges of the Southern Bell Telephone & Telegraph Co. (TELEPHONY, May 9, 1959).

The case was on appeal from a decree by District Court Judge G. Caldwell Herget of Baton Rouge, affirming the commission's refusal to grant a $14,242,478 increase sought by the company.

Rene A. Viosca, associate justice of the Louisiana high court, summarized the court's findings as follows:

(1) The cost of debt capital should be fixed at 5 per cent and not 4 per cent, unless intervening experience justified a cost in excess of 5 per cent.

(2) A reasonable allowance should be made for the normal annual cost of advertising.

(3) The earnings-price ratio to be applied to the hypothetical 55 per cent of capital represented by common stock, should be so adjusted that the end result will be a return of not less than 6 per cent on the property rate base as revised by us.

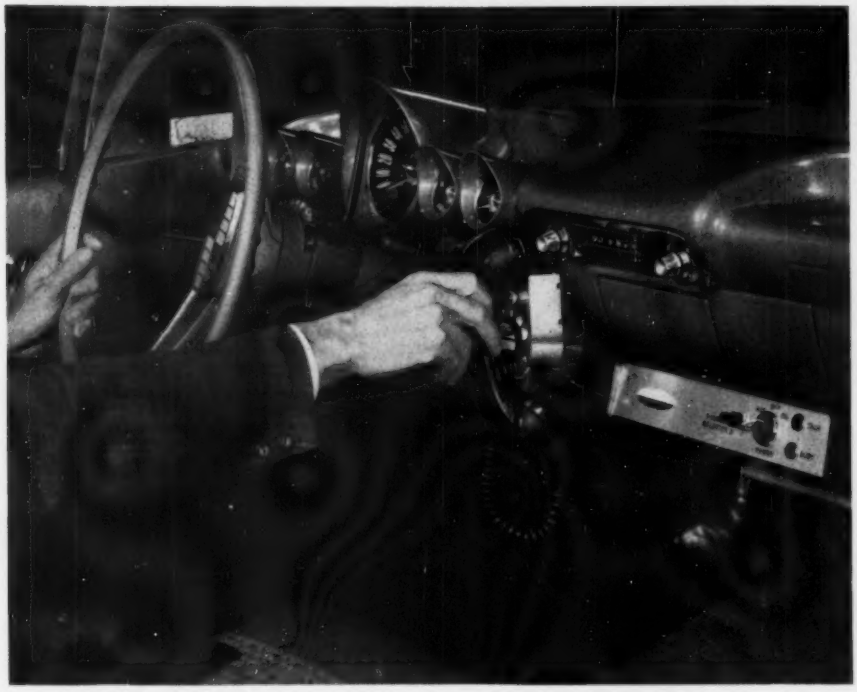
(4) The district court was correct in ordering an increase of $1,918,707 in revenue put into effect at once.

(5) In all other respects the commission was correct in its findings.

The order of the commission, denying the increase sought by the company, dated October 10, 1958, was ordered annulled and set aside.

The court order also directed that "the case be remanded to the Louisiana Public Service Commission for further proceedings, according to the law and the views herein expressed, and that the . . . commission be directed to take appropriate measures to authorize such additional increases in the rates and charges of Southern Bell Telephone & Telegraph Co. as will produce such additional cost revenue from its intrastate operations in the state of Louisiana as will be necessary to meet the views herein expressed."

Associate Justice Walter B. Hamlin, in a concurring opinion said—"Inasmuch as the ascertainment of a fair re-



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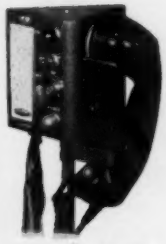

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turn in a given case is a matter incapable of exact mathematical demonstration and is one of reasonable approximation, having its basis in a proper consideration of all relevant facts, I believe that a return of not less than 6.25 per cent will strike the happy medium and will not be unreasonable, whether considered from the viewpoint of the subscriber, the investor, or the company.

"I am in full accord with the reasoning of the court and the decree rendered herein, subject, however, to my views that the rate, as fixed in the decree, should be not less than 6.25 per cent."

Associate Justice James D. Simon also concurred in the reasoning and decree of the majority. He said, "however, in view of the facts presented, I am convinced that the minimum rate of return of 6.25 per cent would be more just and reasonable."

Nat B. Knight, chairman of the commission stated, "I regret very much . . . that the supreme court has indicated that an increase in the intrastate rates for the telephone company is necessary. We definitely will ask for a rehearing of the case before the supreme court."

The present rates, according to the majority opinion written by Judge Viosca, "are not just and reasonable."

Further, Justice Viosca wrote, "in the instant case it is established that no utility is receiving anywhere as low a return as Southern Bell. The disparity is so great, that we must of necessity hold that the action of the Louisiana Public Service Commission in its end result is discriminatory and that the rates fixed are not just and reasonable under the circumstances."

The majority opinion said further, "it is obvious that there is a disparity between the return received by Southern Bell on its property rate base as well as on its equity capital and the return received on the property rate base and equity capital by other utilities in Louisiana (and) in the nine Southern states in which Southern Bell operates and in the United States."

The record shows, Justice Viosca wrote, that there is great necessity for an immediate expansion program in Louisiana. "Realtors, developers, contractors, manufacturers, farmers and businessmen of every character," Justice Viosca pointed out, "have testified to the necessity of an immediate heavy construction program for additional telephone service.

"Business in the state, according to the testimony, is being severely handicapped because it is impossible to get necessary telephone service. Occupants of homes are likewise being seriously inconvenienced.

"It is imperative, according to the record, that Southern Bell immediately expend 49 million dollars on a program of expansion to meet public demand. An annual expenditure thereafter of 46 million dollars per year is required. This construction will necessarily be at inflated prices as compared to previous construction costs."

OK Raises for General of SW Tex., Okla. Exchanges

The following rate increases became effective in exchanges of General Telephone Co. of the Southwest during December:

Cheyenne, Okla.; Dial; 245 stations; Dec. 16.

	Old	New
One-party business	$7.50	$8.50
Two-party business	6.50	7.50
One-party residence	4.20	4.75
Two-party residence	3.60	3.90
Four-party residence	—	3.25

Abernathy, Tex.; Dial; 879 stations; Dec. 10.

One-party business	$9.50	$10.50
Two-party business	8.00	8.50
One-party residence	4.75	5.25
Two-party residence	4.00	4.50
Four-party residence	3.50	4.00

Annona, Tex.; Dial; 152 stations; Dec. 6.

One-party business	$8.50	$10.00
Two-party business	7.00	8.50
One-party residence	4.50	5.00
Two-party residence	3.75	4.25

Boerne, Tex.; CB Manual; 835 stations; Dec. 21.

One-party business	$9.50	$10.50
Two-party business	7.50	8.50
One-party residence	4.65	5.25
Two-party residence	4.00	4.50
Four-party residence	3.40	4.00

Knox City, Tex.; Dial; 653 stations; Dec. 1.

One-party business	$6.50	$8.50
Two-party business	5.00	7.00
One-party residence	3.75	4.50
Two-party residence	3.00	3.75

Markham, Tex.; Dial; 220 stations; Dec. 6.

One-party business	$7.50	$9.50
Two-party business	6.00	8.00
One-party residence	4.25	5.25
Two-party residence	3.50	4.00

Meadow, Tex.; Dial; 139 stations; Dec. 6.

One-party business	$9.00	$11.00
Two-party business	7.00	9.00
One-party residence	4.75	5.75
Two-party residence	3.75	4.75

Muleshoe, Tex.; Dial—EAS; 1,583 stations; Dec. 29.

One-party business	$10.50	$10.65
Two-party business	8.00	8.15
One-party residence	5.25	5.40
Two-party residence	4.50	4.65
Four-party residence	3.75	3.90

Port O'Connor, Tex.; Dial; 148 stations; Dec. 6.

One-party business	$8.50	$10.00
Two-party business	7.00	8.50
One-party residence	4.75	5.50
Two-party residence	4.00	4.75

Ask to Sell in Wisconsin

A hearing on the joint applications of the Waupaca River Telephone Co. to sell its property and of the Weyauwega Telephone Co. to buy this property was held on Jan. 19 by the Wisconsin Public Service Commission.

General of SW in Tex. Rate, Franchise Controversy

The problems involving the rate schedule of the General Telephone Co. of the Southwest in the city of Jacksonville, Tex., and the matter of the city's renewing the company's franchise, were reported Jan. 5 to be nearer solution.

In November, 1959, (TELEPHONY, Nov. 28) the company won its injunction against the city, which has permitted General of the Southwest to operate at its own rates. Since these rates are higher than the city council originally approved, a dispute ensued.

Rates under the city's last ordinance, those asked by the company, and those put into effect by the company in November are shown as follows:

	City Ordinance Rates	Rates Asked	New Rates
One-party business	$9.90	$12.50	$11.50
Two-party business	7.75	10.50	10.00
One-party residence	5.00	6.00	6.00
Two-party residence	4.25	5.25	5.00
Four-party residence	3.10	4.50	4.00

The company has been operating without a franchise in Jacksonville since Dec. 31, 1958. It is reported that the city council has been considering possible condemnation of the company's facilities and operating the telephone company as a city-owned utility. However, the council recently voted 3-2 to grant the company a 20-year franchise.

The council favored renewal of the franchise, providing certain requirements were met. It asked that the company pay a 2 per cent gross receipts tax for 1959; that the company provide full-time and emergency repair service; dismiss its rate suit against the city; and pay all court costs. The company agreed to most of these requests if the city approves its rate schedule.

General of the Southwest currently has a petition before the district court for a permanent injunction against the enforcement of the city's telephone rate ordinance.

Sale of Oregon Company Gets Commissioner's OK

The sale of the Helix Telephone Co. has been approved by Oregon Public Utilities Commissioner Jonel Hill, it was reported on Jan. 6.

Mrs. Ida Eaton, owner of the company, received permission last summer

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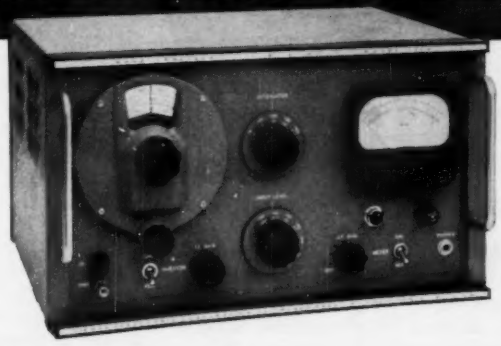

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103B†	3- 40	± 400 cps	± 3000 cps	± 0.5 kc	± 3 db	Note D	600 ohms
104A	5-150	± 300 cps	± 1500 cps	± 1 kc	± 3 db	Note D	600 ohms
108B	15-500	± 550 cps	± 2900 cps	± 3 kc Note B	± 2 db Note C	135 ohms Note D	600 ohms
114A	100-800	± 550 cps	± 2900 cps	Note A	± 3 db	Note D	600 ohms

† Contains carrier re-insertion oscillator for monitoring suppressed carrier systems. Furnished with planetary drive dial. Note A. Ranges from ± 2 KC at low end of dial to ± 3 KC at upper end. Note B. ± 1 KC in the 48 KC to 256 KC region. Note C. ± 1 db for + 30 db to —40 db attenuator steps on 135 ohm balanced measurements. Note D. All models may be converted for 135 and 600 ohm balanced line measurements by convenient plug-in bridging transformer, Model 130D.

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to acquire her deceased husband's share in the company (TELEPHONY, July 4). She now states that she plans to sell the company to Mr. and Mrs. G. E. Baker of Prosser, Wash.

The Helix company serves 130 subscribers.

Deny City Tax Rehearing; OK Financing Pleas in Neb.

On Dec. 29, the Nebraska Railway Commission overruled a motion by the city of Scottsbluff for a rehearing of the commission's original order of Jan. 26, 1959 in which it determined that the United Telephone Co. of the West, Scottsbluff, could add pro rata the amount of occupation tax imposed by the city against the company (TELEPHONY, Dec. 26, 1959).

The commission on Nov. 30, 1959 had dismissed the city's complaint.

On Dec. 31, Central Electric & Gas Co., Lincoln, was authorized to issue and sell up to 2.5 million dollars principal amount of convertible subordinated debentures.

Leonard Nelson, treasurer, said the proceeds would be used to repay outstanding loans and for construction in Nebraska and South Dakota, as well as for investments in subsidiaries.

The commission also authorized the following telephone companies to issue notes: Chrisp's Telephone Co., Paxton; Farmers Telephone Co., North Bend; and Nebraska Central Telephone Co., Gibbon.

Texas T&T Gets Approval Of Raise for Dial Service

J. B. Swink, general commercial and traffic manager of the Texas Telephone & Telegraph Co., Corsicana, announces that the city council of Whitney has approved increased rates for dial service which will allow the company to proceed with enlargement of the Whitney exchange for a toll center.

Mr. Swink listed the following as old and new rates:

	Old	*New*
One-party business	$8.75	$9.50
Two-party business	8.00	8.50
Four-party business	7.50	7.65
Rural business	7.00	8.00
One-party residence	4.75	5.90
Two-party residence	3.50	4.90
Four-party residence	3.25	4.20
Rural residence	4.00	4.50

OK Merger in Canada

Shareholders of both companies have approved a proposal to amalgamate Northern Telephone Co., New Liskeard, Ont., and its controlled subsidiary, Norwesto Enterprises Ltd., Kenora, Ont. (TELEPHONY, Dec. 26, 1959).

Texas Cooperative Buys Three Exchanges

The Guadalupe Valley Telephone Cooperative, New Braunfels, Tex. has acquired, as of Jan. 1, the Westhoff, Kingsbury, and Leesville exchanges of the General Telephone Co. of the Southwest.

Alex H. Elbel, president of the Guadalupe cooperative, said that his company plans two new exchanges in the Gonzales area. One will include customers now being served by the Leesville exchange.

Extended area service is planned between these two new exchanges of Cost and Saturn and General's Gonzales exchange. Westhoff and Kingsbury are to be converted to dial operation.

Carolina T&T Asks Sale Of Stock for Expansion

The Carolina Telephone & Telegraph Co., Tarboro, N. C., asked the North Carolina Utilities Commission on Jan. 13 for authority to sell 176,319 shares of common stock to help finance an 8 million-dollar expansion program in 1960. The company received authorization of a 5-for-1 split last year (TELEPHONY, Nov. 7).

The stock would be sold at not less than $20 a share, and proceeds from the sale would be used to reduce short-term debts incurred in the expansion. The stock would be offered to present stockholders on the basis of one new share for each 10 shares held.

In its petition, the company said it now has about 4,000 unfilled requests for telephone service in its eastern North Carolina territory and that it expects to spend 8 million dollars during 1960.

Carolina T&T also said the number of telephones in its territory has increased from 55,814 in 1946 to 880,779 in 1958, and that it has spent $80,923,769 on expansion between 1947 and 1959.

Propose Mass. Telephone Tax

Massachusetts Governor Foster Furcolo has proposed enactment of state legislation to impose a 10 per cent tax on telephones. He said that Massachusetts could take over the federal telephone excise tax which is scheduled to end on July 1.

Approve Sale in Minnesota

The Minnesota Railroad & Warehouse Commission on Jan. 11 approved the sale of the Lynd Telephone Co. to the Tyler Telephone Co. The Lynd company, which was owned by Alfred and Ella Larson, serves 136 stations.

NET&T Granted 40 Per Cent Of Raise Sought in Vermont

The Vermont Public Service Commission has rejected 60 per cent of a 1.5-million-dollar rate increase sought by New England Telephone & Telegraph Co. (TELEPHONY, Aug. 16, 1958).

The company was granted a $513,200 gross annual increase which will raise its net earnings by about $233,403 after state and federal taxes.

The commission said the company is entitled to a rate of return of 6 per cent on its intrastate rate base of $22,511,275. The company had asked for a 7.5 per cent return when it sought the increase in 1958.

The full amount of the requested raise, 1.5 million dollars, was put into effect in August 1958 after the company posted a 3-million-dollar bond. The commission has ordered the company to refund $994,000, the portion of the requested increase which was disallowed.

Excluded from the intrastate rate base was $433,000 working capital disallowed by the commission. Also disallowed was use of higher depreciation rates predicated on the installation of electronic central office and dial equipment and improved types of telephone instruments because the "evidence showed Vermont intrastate subscribers will not benefit from the use of this new equipment in Vermont for some years to come."

OK Rate Reclassification For PT&T in Washington

Pacific Telephone & Telegraph Co. has been allowed by the Washington Public Service Commission to reclassify its rates for 25 Washington communities.

Commission Chairman Francis Pearson said that the increases were granted without a public hearing for several reasons. He said population in these centers has reached sufficient numbers to put them into new rate brackets.

He also noted that it was the first time in nearly six years that the cities have been reclassified. Subscribers, he added, would have paid the cost of public hearings.

The higher rates will give the company a 6.4 per cent return on its investment instead of the 6.1 per cent previously authorized.

Chairman Pearson said the company's return in Washington will be the lowest of any Pacific Coast state in which it operates.

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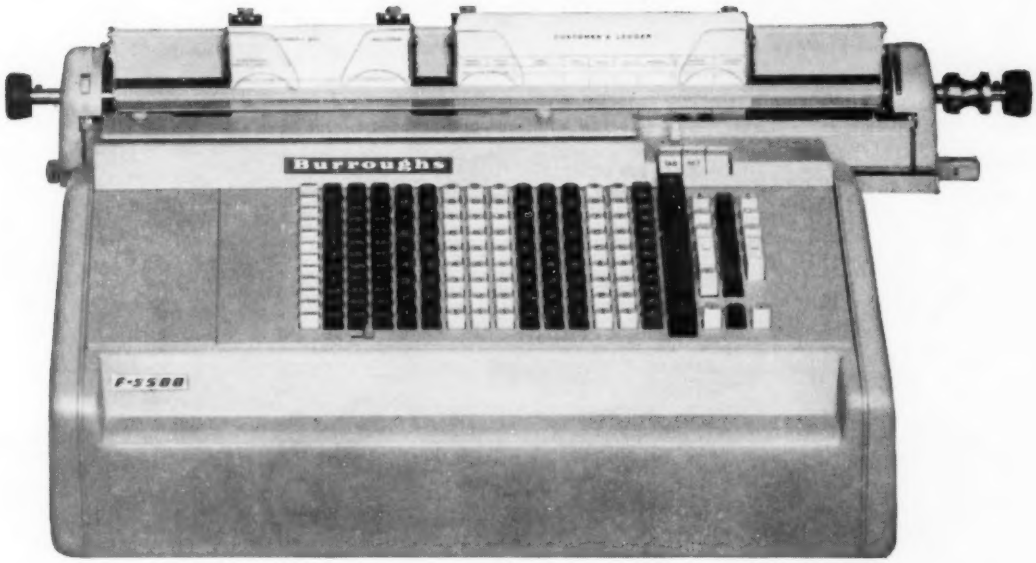

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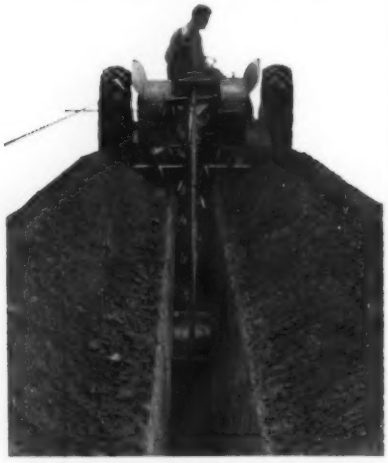

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STATISTICS USED TO FORECAST GROWTH

Continued from page 23

absolute values or amount of change. The advantage of comparing each quarter with the same quarter of the previous year, rather than with the immediately preceding quarter, is that no adjustments need be made for seasonal fluctuations. The chart lists the composite's 13 components, and shows the number of components contracting, compared to the same quarter of the previous year. For example, we see that during the first quarter of 1950, two of the components (which are listed on the left edge of the chart) had smaller values than they had during the first quarter of 1949; during the second quarter of 1950, only one component had a smaller value than it had a year before; during the third quarter of 1950, none of the components was contracting, and so on.

It appears that the composite's cycles lead the telephone demand cycle by approximately three-quarters, and that the critical value in the cycle, on the downward trend, is eight; that is, each time the composite has dropped to the stage where more than eight of the components were contracting, there has been a contraction in new primary station demand during the following quarter, lasting at least two quarters. It is interesting to note that, according to this composite, the recent business recession began at the end of 1955, had a short intermission at the end of 1956 (possibly due to aftereffects of the steel strike of that summer or of the presidential election), and "bottomed out" early in 1958. The early 1956 decline is also apparent in several national indicators, notably Gross National Product in constant dollars; the Index of Industrial Production, especially durables; the Business Week Index; and the University of Michigan's Index of Consumer Attitudes.

After rising constantly since early 1958, the composite is apparently entering another contraction phase, with one component (Incremental Bank Debits) contracting during the third quarter of 1959. However, in view of current effects of the steel strike, we hesitate to interpret a decline in one component as the beginning of a "recession." But if more components begin to decline, it is likely that our company's new primary station demand will begin to decline during the second or third quarter of 1960. Needless to say, we will keep close watch on the component indicators during the next few months.

Since the composite purports to indicate only *directional* changes, it remains to determine *magnitudes*. Independent estimates of dwelling units started in our area since 1949 indicate that at best we can expect to gain at a 95 per cent level of confidence, between 56 and 187 primary stations per 100 dwelling units started, after a two-quarter lag for construction and occupancy. (We found that the spread is not narrowed significantly by excluding business primaries from the relationship.)

Now, we realize that this is a rather imperfect relationship, but as we accumulate more reliable building permit records for our serving area, we hope to narrow the range somewhat, possibly to between 100 and 140 primaries per 100 starts. Greater accuracy than ± 20 per cent is not possible at this time in a field so strongly influenced by the so-called "human element" which affects our correlations in many unpredictable ways.

The following forecast of station growth is thus indicated for the next two quarters, based on building permits issued during the second and third quarters of 1959:

	Dwelling Units Started(1)	FORECAST CHANGE IN PRIMARY STATION DEMAND		
		Minimum(2)	Maximum(3)	Most Likely(4)
4th quarter 1959.....	11,420	10,000	21,400	13,700
1st quarter 1960.....	9,060	5,800	16,900	10,900

(1) Estimated from building permits issued in our serving area during the second and third quarters of 1959. We use a conversion formula, which assumes 66 per cent of permits started within a month of issuance, 23 per cent during the second month, and 4 per cent during the third month.

(2) Based on the Composite Economic Indicator, which indicates fourth and first quarter station gains in excess of the corresponding quarterly gains of last year.

(3) At 187 per cent of units started, the maximum historical ratio of primaries to starts, at 95 per cent level of confidence.

(4) At 120 per cent of units started, 120 per cent being the median historical ratio of 38 preceding quarters.

Although the composite has accurately forecast the directional trend of primary station growth for the three quarters since its creation, we expect that at least two or three years of actual use will be required to prove its true worth, and to sharpen the relationship of new dwelling units to new primary demand.

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metropolitan area, is perhaps better blessed with local economic statistics than most other Independent telephone companies. Nevertheless, we hope that this article will be of some interest to all of our friends as an indication of one approach to determining the effects of a local economy on telephone growth.

In conclusion, it should be emphasized that as a tool for management, no statistical device can substitute for the sound business judgment that comes only with long and hard experience—and this is especially true of forecasting devices such as this composite. Until the "human element" can be measured and predicted with reliability, forecasting will probably never achieve the status of a pure science.

Experience Guides

Deciding on a career is a big problem for today's youngsters. The choice is made easier for many young people who participate in the Junior Achievement program. As a member of a working corporation, the youngsters get an authentic taste of many career fields. This "preview" of life in the business world helps them base their career decisions on down-to-earth experience. Many have thus discovered previously unsuspected abilities which shaped their future studies and subsequent careers.

Continued from page 34

(c) Daily.
(d) Weekly.
(e) Semi-monthly.
(f) Monthly.
(g) Quarterly.
(h) Semi-annually.
(i) Annually.

(B) DUTIES—What is to be done.

(C) INSTRUCTIONS—*How* it is to be done.

(a) Find the best way to do the job.
(b) Outline each item so that it can be done by others accurately, efficiently, economically and intelligently.
(c) Use SAMPLES where necessary and helpful.

(D) DISPOSITION—*Where* it is to be forwarded or filed (include address if forwarded).

Company and departmental instructions are, of course, always available, but the location of these records may not be familiar to everyone; therefore, you would include this in your Instructions.

Much time and thought is a requisite if a thorough, detailed job plan is the result. You haven't the time to prepare such a plan, with all the work you have to do at the office? If your "spare" time at the office is already at a premium, wouldn't it be to your own advantage to "create" a few hours for such a project, even if other chores are postponed? Certainly such a plan would eliminate haphazard working habits and create a smooth operation for your future office paper work.

This plan will certainly solve the *when*, *what*, *how* and *where* of your clerical chores. You must already know *why* or you shouldn't be doing it in the first place!

Jackson Is General Service Corp. Engineering Head

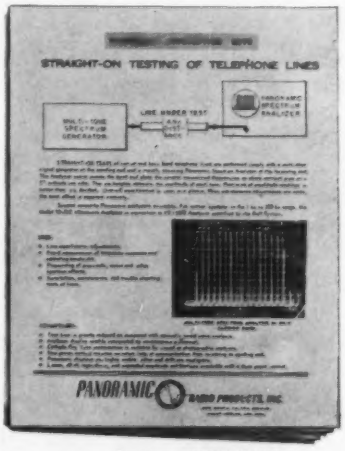
Ira B. Jackson, long-range planning engineer with General Telephone Service Corp., succeeded Frank D. Reese as director of engineering for the corporation on Jan. 1, according to an announcement by Walter G. Wright, vice president — operations, General Telephone & Electronics Corp.

I. B. JACKSON

On Jan. 1, Mr. Reese became president of General Telephone Laboratories, Inc., Northlake, Ill.

Mr. Jackson graduated from Purdue University with a B.S. degree in electrical engineering, and has taken advanced work in radio and electronics at the University of Wisconsin.

After serving with the Indiana Bell and Wisconsin (Bell) Telephone Cos., Mr. Jackson joined the General System in 1945, when he became general plant engineer at the system's predecessor Indiana company. He was promoted to chief engineer in 1950, and in 1958 was transferred to his present position in New York.



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Ralph F. Lucier, United Executive, Dies

Ralph F. Lucier, 66, vice president-telephone operations of United Utilities, Inc., Kansas City, Mo.; president of United Telephone Co. of Indiana, Inc., and of Ohio Telephone Service Co., died at St. Joseph's Hospital in Fort Wayne, Ind. on Jan. 13. He had been admitted to the hospital on Jan. 3 after suffering a heart attack at his home in Warsaw, Ind.

R. F. LUCIER

Born at Concordia, Kan., Mr. Lucier moved to Abilene as a young boy. He was a lifelong friend and schoolmate of President Dwight Eisenhower. After graduating from high school at Abilene, he attended Kansas State College at Manhattan.

Mr. Lucier served as an infantry captain during World War I and was present at the first meeting in Paris, France, for the founding of the American Legion. During the years that followed, he was an active member and ardent supporter of the Legion and its activities.

Prior to joining the United System in 1931, he had been an executive with the Southwestern Bell Telephone Co. He was transferred from his native Kansas to Indiana in 1935. During the ensuing 25 years, he saw the United properties grow from a small organization into the second largest Independent telephone system.

President Eisenhower appointed him head of the Communications Equipment Division of the National Production Authority at Washington, D. C., in 1952. He served the government in this capacity until Jan. 30, 1953, when he returned to Warsaw, Ind.

Mr. Lucier was a past president of the Independent Telephone Pioneer Association and had served as a member

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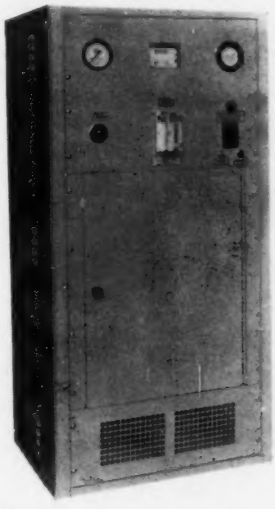
Exchange equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 30 cables. The unit is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.



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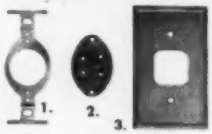
*SE-60 and SE-16B, 45c

Modern Plug and Jack Assembly

Latest telephone practice calls for use of the SE-63A (open) junction box, SE-60 mounting ring with oval SE-493A jack, and one of several types of the SE-16 series face plates. The SE-63A junction box screws into vertical wall studs (2"x4" or other) and accepts the hardware assembly as above.



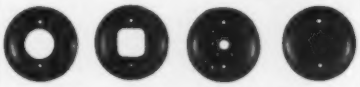
1. SE-43A Bracket 30c ea.
2. SE-493A Oval Jack $1.30 ea.
3. SE-19B Plate 28c ea.

Modern flush outlet installation utilizing SE-19B standard face plate, SE-493A oval jack, and SE-43A bracket holed for standard conduit box.

Face Plates

45c each, including SE-60 mounting ring and screws.

SE-19B



SE-16A | SE-16B | SE-16C | SE-16D

Five styles of face plates are available. SE-16A takes SE-47C multi-service, 12-terminal connecting block; SE-16B takes SE-493A jack; SE-16C for permanent phone; SE-16D for undecided service; SE-19B accepts SE-493A with SE43A bracket, or, SE-404B jack with SE-44 bracket for flush mounting.

Write Suttle or your local distributor for installation instructions and prices on the above piece parts. In brown, ivory, or blue-beige.

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of the board of directors of United Utilities, Inc.; of the United Telephone Co. of Indiana, Inc.; of the Ohio Telephone Service Co.; the United States Independent Telephone Association and the Indiana Telephone Association.

Surviving are his widow, Ruby Norman Lucier, whom he married at Abilene, Kan., on Aug. 10, 1917; a son, Philip J. of Rochester, N. Y.; a daughter, Mrs. John Stineman of Cincinnati; 19 grandchildren; 4 brothers and 7 sisters.

United Utilities Assigns Childers As Coordinator

The appointment of Don D. Childers as staff coordinator has been announced by United Utilities, Inc. Mr. Childers assumed his new duties Jan. 1 in the executive offices in Kansas City, Mo.

D. D. CHILDERS

In this assignment, Mr. Childers will coordinate various telephone operations of the United System throughout the 15-state area in which it operates. Prior to this appointment, he was connecting company agent for the United Telephone Cos.

He started his career as a staff accountant with the Washington Public Service Commission in 1946.

In 1948 he joined the Oregon-Washington Telephone Co., a United subsidiary company with headquarters at Hood River, Ore. In his 10 years with Oregon-Washington, he served in various capacities; the latest position being that of general commercial and traffic superintendent.

Mr. Childers is a past president of the Washington Independent Telephone Association and is presently a member of the USITA Sub-Committee on Message Toll Compensation. He is also a member of the USITA task force which compiled the USITA Separations Manual now being distributed to the industry.

Retired PT&T Man Sets Up Olden Days Exchange

Timbuktu is more than the name of a far-away place. It is a voice out of the past for Theodore R. Hewitt, general plant supervisor of the Pacific Telephone & Telegraph Co., Washington and Idaho area.

Theodore R. Hewitt, who retired recently as general plant supervisor of the Pacific Telephone & Telegraph Co., Washington and Idaho area, is shown in 1910 at his first "Timbuktu" exchange, located in his room. Although only 15, he was a subscriber to TELEPHONY (two copies in background) and a night operator for the Southern New England Telephone Co.

Mr. Hewitt, whose retirement was effective Dec. 31, has set up the Timbuktu exchange in the basement of his Seattle home. It services his collection of 18 old telephones, ranging in vintage from 1895 to 1927.

They line two walls of his basement workshop and connect to a 1905 switchboard salvaged from a manual office at Hoodsport, Wash. Each instrument illustrates a major development in telephone design.

These old sets represent quite an investment in time and detective work for Mr. Hewitt. They come from some places remote from Seattle.

The oldest telephone in his collection, the 1895 model, is an old magneto, crank-type instrument Mr. Hewitt found in a chicken coop in the San Juan Islands.

The telephones all are in working

order and Mr. Hewitt can use any of them to telephone outside his home.

He spent much time polishing the walnut cases and nickel-plated fixtures of these old instruments.

Since many people had evidenced an interest in seeing the collection, he decided to hold a series of open houses. He had a Timbuktu directory printed, worked up a system by which he could simulate long distance calls, and prepared a tape-recorded program to accompany his demonstration.

The program begins, "Welcome, folks, to Timbuktu . . . a Bell System exchange of an early day," and outlines the history of each telephone in the collection.

In a letter to the editor of TELEPHONY, Mr. Hewitt stated that he has been a subscriber to and avid reader of TELEPHONY since 1910, starting at the age of 15.

He began in the telephone business at the age of 12 at the Bancroft, Ia., exchange, then owned by his uncle. He learned to operate the magneto switchboard and helped his uncle repair telephones that were on the storeroom shelf.

In 1910 and 1911, he secured a job as night operator at the Simsbury, Conn., exchange of the Southern New England Telephone Co.

Mr. Hewitt had a "Timbuktu" exchange back in 1910—from the kitchen of his home, up to his room, and extending down the block to a friend.

After four years with the Southern New England company, Mr. Hewitt moved to California. He worked part-time for Pacific Telephone's Los Angeles office while he attended the University of Southern California. After graduation, Mr. Hewitt joined PT&T at its Seattle office.

In his letter he also added that he and his wife planned a year-long-trip to Europe and that on his return, he would renew his TELEPHONY subscription.

Manufacturing in India

The Indian Telephone Industries, Bangalore (Mysore), has released the following figures for the year 1958-1959: During the year, the government-owned company made a net profit of $556,492.22 and declared a 2½-percent dividend. A reduction in manufacturing costs and lowering of prices was achieved. The industry produced 84,300 telephones, 41,200 exchange lines, and 332 small exchanges.

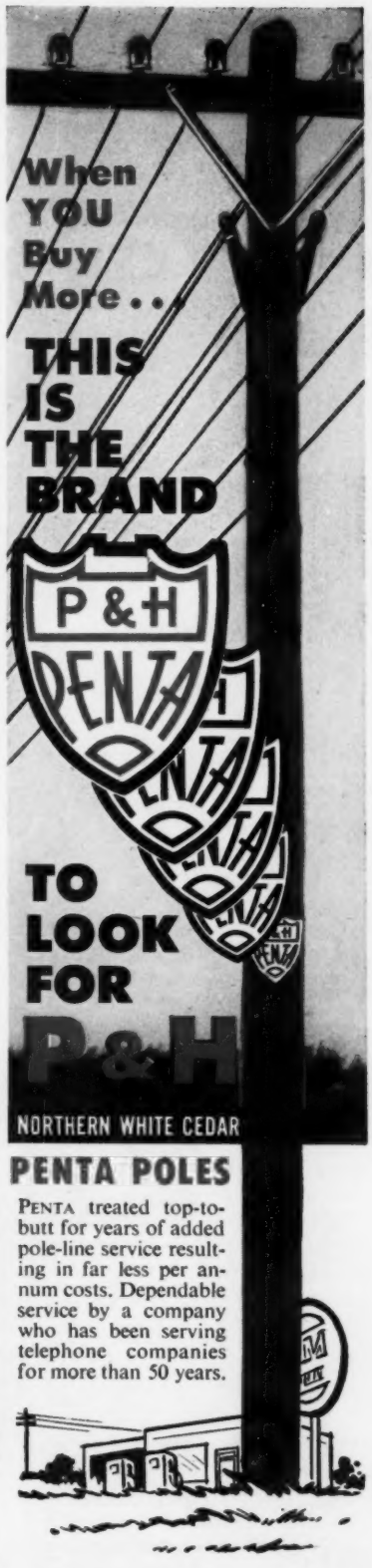
Obituary

PAUL J. MENZER, manager, pole department, Baker Wood Division of D. B. Frampton & Co., died on Jan. 6.

Grow from Failure

"We learn wisdom from failure much more than from success: we often discover what will do by finding out what will not do; and probably he who never made a mistake never made a discovery. Horne Tooke used to say of his studies in intellectual philosophy, that he had become all the better acquainted with the country through having had the good luck sometimes to lose his way."—SAMUEL SMILES.

The Commonwealth Telephone Co., Wilkes-Barre, Pa., early in December, cut over its Troy, Pa., exchange to dial service. Shown in animated conversation is Commonwealth president, Jack Sordoni, who placed call to Sen. Andrew J. Sordoni, company board chairman, in Florida. Joining in the conversation, left to right, are Burgess Wyle McClure, and William Beaman, president of the Troy First National Bank. Later, calls to Troys in New York, Alabama, in Illinois and in New Hampshire were put through speedily, demonstrating the new service. Troy exchange comprises 1,336 stations, and Towanda serves as the toll center.



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20-gauge KRENE has up to 16,000 volts dielectric resistance! Exceeds Flammable Fabrics Act requirements.

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12 or 20-gauge KRENE, formed with electronic Super-Weld* seams, is pliable in most any weather, stands rough usage, long wear.

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Lightweight, yet rugged and resistant to acids, oils, alkalis. Fold and store wet—it won't rot or mildew! Washes easily with soap and water.

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Weighs only 9 lbs. Front and top flap open for easy entry. Raise and snap secure for ventilation. Top spring-bar assures rain run-off. Fits Bell System type frames.

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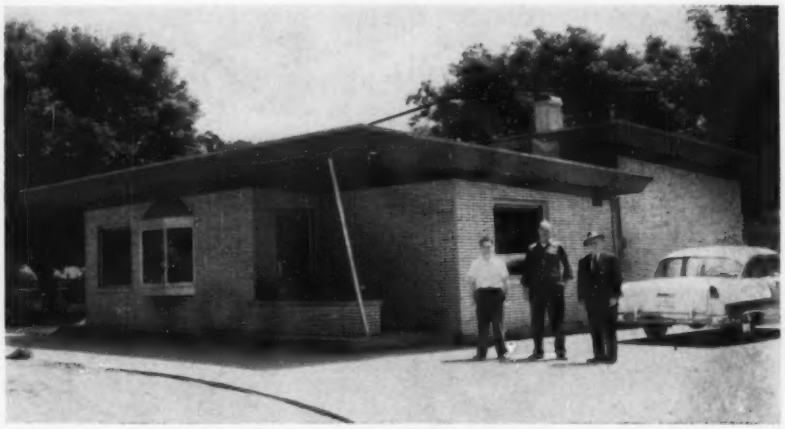


Public Service Telephone Co.'s Montrose, Mich., exchange, one of two to be cut over to DDD and to all-numeral numbering. This and the company's New Lothrop exchange are the first in Michigan to employ seven-digit numbering.

Mich. Independent Goes DDD And All-Numeral Numbering

Public Service Telephone Co., Montrose, Mich., was to cut over its Montrose and New Lothrop exchanges to nationwide Direct Distance Dialing on Jan. 17, according to an announcement made by W. L. Jennings, company president.

Simultaneous with cut-over to DDD, the company is introducing seven-digit, all-numeral numbers for all subscribers.

Mr. Jennings stated that the two exchanges will be among the first dial exchanges in the nation—and actually the first in Michigan—to pioneer all-numeral numbers.

Equipping the Montrose and New Lothrop central switching offices for DDD was a $17,000 project, according to Mr. Jennings. In expanding plant facilities, the company installed approximately 757,000 conductor-feet of cable at an additional cost of $26,472.

GE Communications Reports Two Management Changes

Peter G. Smee has been appointed manager of microwave systems design for General Electric's Communication Products Department at Lynchburg, Va. The appointment was announced by I. T. Corbell, the department's manager of microwave engineering.

Mr. Smee is a native of Lincoln, England and received his technical training in the United Kingdom. He holds several U. S. patents in the communication field.

He joined General Electric at Electronics Park, Syracuse, N. Y., in 1946 and has specialized in microwave engineering for the past several years.

He is a senior member of the Institute of Radio Engineers.

General Electric's Communication Products Department at Lynchburg also named Elmer W. Hassel as manager of tone-signalling and filter design engineering.

This position, newly-created, involves responsibility for design of terminal communication equipment, quartz crystals and filters for General Electric's two-way radio, microwave and carrier current products.

With G-E since 1951, Mr. Hassel has specialized in the design and development of selective calling communication devices and tone signalling equipment. He has a background in the field of telephone, radio communications, and telegraphy.

Following his graduation from Milwaukee School of Engineering in 1943, with a bachelor of science degree in electrical engineering, Mr. Hassel joined the staff of the Office of the Chief Signal Officer, wire communications section, Engineering and Technical Service, Washington. There, he was engaged in studies related to the development and testing of carrier telephone terminals and repeaters, voice frequency telegraph terminals and repeaters, speech-plus-duplex equipment and amplifiers for the military service.

From 1946 to 1951, he was a faculty member of the Milwaukee School of Engineering where, immediately prior to his association with General Electric Co., he was professor of electrical engineering and head of the electronics branch of the department of electrical engineering.

He is a member of the American Institute of Electrical Engineers and of the engineering management professional group of the Institute of Radio Engineers. He is also affiliated with the Lynchburg Society of Engineering and Science.

Heflin, Phillips in New Posts at Lenkurt

The election of William H. Heflin as a vice president and a director, and of Lee G. Phillips as treasurer and controller of Lenkurt Electric Co., Inc., was announced recently by John J. Douglas, president of the electronics firm.

W. H. HEFLIN

Both of the new officers are longtime Lenkurt employes. Mr. Heflin has been general manager of the commercial products division the past year, while Mr. Phillips has been controller and head of all accounting operations.

Mr. Heflin succeeds Philips B. Patton, a vice president since 1952, who resigned and plans to retire from active business in the near future. Mr. Patton will continue as an adviser to the officers of the company for several months.

The board also accepted the resignation of Kenneth R. Rickey as vice president and treasurer and as a director. Mr. Rickey, an officer of the company since 1953, will also continue in an advisory capacity.

Mr. Heflin joined Lenkurt in 1948 as a sales order editor. During the next several years, he held various managerial assignments in applications engineering, production, and military engineering.

He became manager of procurement in 1953. Two years later he was promoted to general manager of Lenkurt's Canadian subsidiary in Vancouver, B. C. He returned to San Carlos a year ago to head commercial operations.

Heflin received the BSEE degree from the University of Colorado and the MBA degree from the Stanford Graduate School of Business.

L. G. PHILLIPS

Mr. Phillips was a U. S. government auditor three years and a certified public accountant in San Francisco for seven years before joining Lenkurt in 1951.

His first position with the electronics firm was as chief accountant in Lenkurt's special equipment division. He became assistant controller in 1954 and was advanced to controller two years later.

Phillips was graduated from the University of California with the BS degree in 1940.

He is a member of the American Institute of Accountants and the National Association of Accountants, and headed the Peninsula chapter of the latter organization this year.

Have a Care!

"'Honesty is the best policy'; but he who acts only on that principle is not an honest man.—No one is habitually guided by it in practice.—An honest man is always before it, and a knave is generally behind it."—WHATELY.

Answers To Questions On Page 32

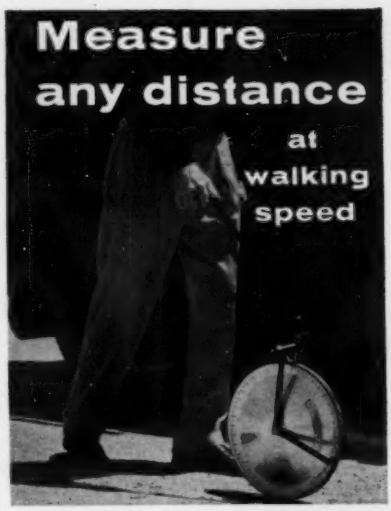
(1) Most telephone numbers in Anchorage consist of five numerals.

(2) Yes.

(3) Alaska has been assigned the NPA Code 907.

(4) Most telephone numbers in Fairbanks consist of four numerals.

(5) By selecting a trunk in the multiple and dialing or operating ringdown using standard operating and routing procedures.



records 100,000 ft.
automatically!

It's So Easy to measure with a Rolatape ...and you save time on every estimating job...no tapes to wind, no helper is required. You get precision-accurate measurements every time.

Records Feet automatically and the accumulated total is always in full view.

Shows Inches, and Fractions of an inch. Wheel is calibrated in inches and fractions for quick easy reading.

Shows Tenths of a foot. Wheel is calibrated in tenths on reverse side for engineers.

There is a variety of Rolatape Models to suit your needs. See them at your local dealers.

Write for information and name of local dealer today!

Rolatape, Inc., 1741 14th St., Santa Monica 2, California

Rolatape
Measuring Wheels

General System Engineers Complete AE Symposium

The second in a series of transmission engineering symposiums for General Telephone operating company and Automatic Electric Sales Corp. personnel has been completed by 32 students at Automatic Electric Co., Northlake, Ill.

The classes are designed to acquaint transmission, protection and plant engineers with the "why" of telephone plant design problems. The symposium contained courses on psychoacoustics, telephone instruments, telephone line mathematics, local loop design, nationwide toll switching systems, principles of electrical coordination and protection, as well as a complete range of specialized transmission engineering classes.

Joseph N. Petrie, Automatic Electric chief transmission engineer, headed the 10-day program, with Charles D. Hansell, General Telephone Service Corp. transmission and protection engineer, serving as his chief assistant.

Completing the course were: J. C. Mau, L. L. Sutton, and T. V. Stein, General of Michigan.

J. J. Clay Jr., C. M. Helms, M. G. Helms, W. F. Johnston, C. R. Robison, and J. D. Tuck, General of the Southwest.

R. E. Schneider, General of Illinois; R. G. Humphries, General of Indiana; and R. J. Quade, General of Wisconsin.

John Davis, Harold Shaner, William Fisher, and Joseph Senft, General of Pennsylvania.

D. H. Potter, General of California; L. H. Schick, General of the Northwest; E. L. Juergens, D. C. McLaren, W. A. Shaw, General of Florida; W. L. Sampson, General of Southeast; William Veness Jr., J. A. Slanser, General of Ohio; and S. B. Vickery, General of Kentucky.

W. E. Bausticker, J. G. Strickland, H. W. Fuller, G. E. Lenz, and J. A. Teslik, AE Sales.

F. B. Sikorski and R. C. Clark of the General Telephone Laboratories.

Copperweld Steel Promotes Ringstad

Erling Ringstad, manager of Copperweld Steel International Co. since its inception in 1944, was appointed executive vice president of Copperweld Steel International, effective Jan. 1.

ERLING RINGSTAD

Mr. Ringstad joined the sales department of Copperweld Steel Co. in 1936. For many years prior to that time, he was engaged in transmission and distribution engineering work with Electric Bond & Share Co. in Argentina and New York, and with the Duquesne Light Co. in Pittsburgh.

At one time, he was in the electrical engineering department of the Braden Copper Co. in Chile, and with the testing and general engineering departments of Westinghouse.

The Copperweld Steel International Co. is the export sales agency of Copperweld Steel Co. In addition to selling products manufactured by the various divisions of the parent company, it also markets allied products of other American manufacturers.

Kuntz Joins CEECO As Vice President-Engineering

Donald L. Kuntz has joined Communication Equipment & Engineering Co. as vice president-engineering.

Mr. Kuntz was formerly with the American Telephone & Telegraph Co.

He began his telephone career in Rock Island, Ill., with the Illinois Bell

D. L. KUNTZ

Telephone Co. After two years in various plant installation and maintenance jobs, he moved to the transmission engineering staff in Chicago, where he worked for three years engineering exchange and toll cable and carrier plant.

In this capacity, he was instrumental in instituting improved trunk transmission by use of negative impedance repeaters on loaded trunk cables. He also contributed to the economical application of properly loaded fine gauge cable and efficient telephone sets on subscriber loops, CEECO states.

On the AT&T company engineering staff, Mr. Kuntz served in a liaison capacity between the Bell Laboratories, Western Electric and the associated Bell companies to develop requirements for, and to promote use of, new transmission systems. He also evaluated non-Western Electric Co. carrier systems for use in the Bell System.

L. M. Berry & Co. 25-Yr. Vets Honor Four Employes

The L. M. Berry & Co. honored four veteran employes in Dayton recently when H. F. Scott, B. B. Barnett, M. M. Gutnik, and H. F. Welch were recognized for long and outstanding service at the 25-Year Club banquet.

A complete telephone directory publishing service

300 Montgomery Street
San Francisco 4,
California

631 Braniff Building
Exchange Park North
Dallas 35, Texas

2911 Bond Street
Everett, Washington

115 South Rusk Street
Kilgore, Texas

121 S.W. First Street
Beaverton, Oregon

130 East Lime Avenue
Monrovia, California

Recent L. M. Berry & Co. 25-Year Club banquet honored four veterans, H. F. Scott, B. B. Barnett, M. M. Gutnik, and H. F. Welch. Seated (L. to R.): Eastern Manager F. L. Hawker; Mrs. H. F. Scott; General Sales Manager John W. Berry; Mrs. F. L. Hawker; Mrs. L. M. Berry; General Manager W. A. Steuer; Loren M. Berry; Mrs. Gertrude Embry; Executive Assistant J. P. Fraim; and Southern Manager J. P. White. Standing (L. to R.): Mrs. R. A. Maner; Statistician H. C. Hull; Mrs. M. M. Gutnik; Florida Division Manager R. A. Maner; Miss Geraldine Lively (General Office); Mrs. J. P. Fraim; Mrs. J. P. White; Kentucky salesman B. B. Barnett; Mrs. Agnes Herbst (General Office); Mrs. H. F. Welch; Ohio salesman W. J. Henneberry; Mrs. B. B. Barnett; Wisconsin salesman M. M. Gutnik; Mrs. H. C. Hull; Mrs. W. A. Steuer; Mrs. E. C. Longstreth; Ohio salesman H. F. Welch; Mid-Western Manager H. F. Scott; Ohio salesman E. C. Longstreth; and F. Herbst.

Each was awarded a gold watch and service certificate by Loren M. Berry, founder of the telephone directory advertising firm.

Mr. Scott, the company's Mid-Western Territory Manager, joined the firm in Dayton as a salesman on Jan. 15, 1934. In 1936 he was appointed Western Division Manager, and in 1943 he was placed in charge of all sales operations west of Ohio.

In 1947 he established the Milwaukee office when L. M. Berry & Co. acquired the directory advertising work of the Wisconsin Telephone Co.

He served there until January 1, 1954, when he was appointed to his present position. He directs the operation of L. M. Berry & Co.'s mid-western, western, Florida, and Ohio divisions.

Mr. Barnett joined the company on Sept. 15, 1934, in Louisville, as a member of the company's Kentucky division, and has also sold directory advertising throughout much of the company's operations in the South.

A native of Canada, Mr. Gutnik joined the firm on Oct. 6, 1934, in Winnipeg. In 1939 he was appointed sales manager of the Winnipeg office, serving in that capacity until 1948, when the company ceased its Canadian operations. He was then transferred to Milwaukee, where he has been carrying out sales and supervisory assignments in Wisconsin since that time.

Mr. Welch joined L. M. Berry & Co. on Dec. 8, 1934, as a salesman in the Ohio Division.

L. M. Berry & Co. handles the directory advertising for some 270 Bell and Independent telephone companies in 30 states.

Geneen Announces Seven ITT Personnel Shifts

Further moves to strengthen its world-wide management organization were disclosed on Jan. 5 by International Telephone & Telegraph Corp. in the advancement and appointment of several key executives.

In announcing the personnel changes, H. S. Geneen, president, explained, "This is another step towards our objective of drawing together the entire ITT system into a truly integrated communications and electronics enterprise."

Henri Busignies, former president of ITT Laboratories, has been named vice president and general technical director of the parent company for closer coordination of ITT's global research and development activities. A 30-year veteran with ITT, he holds over 100 pat-

ENGINEERS

New Facts about the Openings and Potential at—

ADVANCED COMMUNICATIONS ENGINEERING

TELEPHONE ENGINEERS: Immediate openings as field engineering supervisor for telephone outside plant and inside plant engineers. 10 years of broad industry background. With some direct field experience desirable.

To arrange for a Confidential interview, please send resume to:

MR. H. J. RECKAS, *Personnel Manager*

ADVANCED COMMUNICATIONS ENGINEERING

A Division of Cook Electric

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TELEPHONE GR 7-7020 OR GA 6-7767
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CENTRAL OFFICE INSTALLATION
World-Wide

KILLOREN COMPANY
Construction crews—Installers
Cable Splicers
30 years experience
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REgent 3-5549

HARRIS-McBURNEY CO.
PUBLIC UTILITY CONSTRUCTION
A complete construction service for the telephone industry
Construction Crews Designing
Station Installers Appraisals & Reports
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Telephone ST 4-6126
P. O. Box 267 Jackson, Michigan

ents in aerial navigation, radar and communications.

Replacing Mr. Busignies and also taking over as president of the ITT Federal division, a manufacturing arm of ITT, is I. Nevin Palley, formerly senior vice president of Temco Aircraft Corp., Dallas. Mr. Palley has had extensive technical and managerial experience in the aircraft industry and, at Temco, reorganized that corporation's engineering and electronics departments into a single "weapon systems concept" organization.

A. G. Kandoian, vice president-communication systems at ITTL, has been made vice president and general manager of the laboratories.

Two former members of Mr. Busignies' staff at the laboratories, Robert S. Carruthers and Paul Adams, have been made assistant technical directors and will move to ITT headquarters in New York.

P. C. Sandretto, formerly vice president and technical director of the laboratories, has been moved to the position of deputy group executive—U. S. defense group. Also named to the defense group is E. J. Whalen, as director of contract administration.

C. M. Mooney will continue as head of the government relations department, with offices in Washington, but will enlarge his staff to handle additional responsibilities, Mr. Geneen said.

Average Not Enough

"It is extraordinary performance that makes for high accomplishment and for social and material progress. Average performance is simply not enough, and if we are to enjoy new horizons of the spirit, the mind or of the body, we need to be sure there is a sufficient array of external incentives to make men willing to attempt the really difficult tasks, even while recognizing the possibility that they may fail in that attempt."—CRAWFORD H. GREENEWALT, *Human Achievement and the Free Society.*

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DESIGN—SURVEYS—APPRAISALS—Construction and Maintenance of Overhead and Underground Telephone Plant. Complete supply of poles available for emergency requirements.
48 GRISWOLD STREET
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TUDOR AND YAGER, INC.
Telephone Construction
TIPTON, INDIANA
Phone OSborne 5-2267

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"AT TIMBER TREATING PLANTS"
Of poles, crossarms, and preservative treatments. Analysis of wood preservatives. Consultation and specification writing.
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Central Office Installation
Cable Splicers, Plant Crews, Installer Repairmen
HENKELS & McCOY
PHILADELPHIA
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T. E. I.
TELEPHONE ELECTRONICS INSTALLATION CORP.
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FREE Estimates
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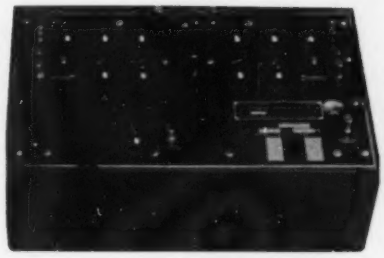
2002 E. Wisconsin Ave. REgent 4-9881
Appleton, Wisconsin

VF REPEATERS (dry line) ($500 value) $100

- TRY AT OUR RISK -

Every sale has lead to reorders



12 to 18 DB gain
(2 or 4 wire)
115-230 VAC & 12 VDC building-out network & protection built-in weatherproof wood case removable for 19" rack mtg. Brand new....$100
Good used.... 75

- manual loaned free -

OA-8 W.E. VF REPEATERS (3-circuit)

7'x19" steel rack with 2-4 wire hybrid & composite telegraph set. New $300

VF RINGER, EE 101 (2-circuit) W.E. 20 cy-1000 cy-20 cy 115-230 VAC (also 12 VDC) $100

CARRIER, 3-channel+VF

W.E. CF1A (Sig. Corps)

Repeaters, for use with CF1a CF3A, new

W.E. C-Carrier Terminals

C-Carrier Repeaters

TEST BOARDS & EQUIPMENT

Brand new, W.E., Wire Chiefs'

Patch cords & plugs

Jacks & Mountings

Relay Racks

Bridges—L&N

Transmission Measuring Sets

Portable line Test sets

MDF PROTECTORS
Complete

W.E. #1435 W, 20 pr. $10 new
1268 A, 20 pr. 10 new
1269 A, 20 pr. 10 new
C50 A, 50 pr. 40 new
25 recond.
C52 A, 52 pr. 42 new
37 recond.
A.E. #675, 20 pr. 10 new
22 pr. 12 new

MDF VERTICALS, W.E. & Cook cable rack & fittings

W.E. Interior Terminals & Chambers protected & unprotected types

Raytheon Rectichargers - Rectifilters 24 Volt

Shipped On Approval
Satisfaction Guaranteed

Huge Savings on everything in our multi-million dollar stock.

Let us quote on your other needs

SWITCHBOARDS, manual

W.E. #12 (universal) new (also BD110)

W.E. #605 PBX new

W.E. #551A PBX rebuilt 20 to 60 line

W.E. #506 PBX (cordless) 7 to 12 line, rebuilt

Kellogg CB (universal) 1600 type Per spec #38008 (post war)

16 cord circuits (univ. per #4501-1, 5)

SL, 2 or 4 or 10 party ringing

#258 jacks and #25 lamp jacks wired to multiple cables (little wear)

Line & cut-off relays wired to term. on relay racks—also trunk & mag equip. power board, etc. (priced to move *now*)

Kellogg PBX K-100 (100 line) new & rebuilt

Kellogg PBX (Cordless) #1007 5x12, brand new.....$150
also some 5x20, new.....$200

Kellogg 200 line CB-LB Central Office, used 1 year (like new) $800

Stromberg-Carlson #106 PBX (80 line) like new.....$400

SWITCHBOARD PARTS
(all mfg.)

New & Good Used

Jack & Lamp Strips

Line & cut-off relays, trunk, etc.

Cord & plugs, lamps & caps

Lamps:

W.E. A-1, 24 volt, new.....$16 C
G.E. 24B, 24 volt, new..... 16 C
G.E. 18B, 18 volt, new..... 16 C
many others (same price)

The Telectric Co.

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CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less. Classified advertisements must reach us 8 days before publication date.

POSITION WANTED

17 YEARS' EXPERIENCE in plant, traffic, commercial, toll separations and management. Available soon. Write Box No. 4345, c/o TELEPHONY.

MALE—WHITE—38. Starting 20th year Bell system plant. Two years SAGE—one and one-half years college. Complete qualifications upon request. Write Box No. 4349, c/o TELEPHONY.

PLANT ENGINEER OR MANAGER. Experienced in Design, Construction, Conversions, Commercial, Accounting and Appraisals. Write Box No. 4350, c/o TELEPHONY.

YOUNG MAN WITH COLLEGE DEGREE, commercial experience with Bell system and Independent telephone industry, desires position with an Independent telephone company. Write Box No. 4348, c/o TELEPHONY.

DESIRE RELOCATION with progressive company. Opportunity to advance. 14 years telephone experience—Linework, Construction and Maintenance, Cable Splicing Foreman. Write Box No. 4351, c/o TELEPHONY.

WIRE CHIEF, Equipment Engineering or Maintenance position. Young man with nine years telephone experience desires permanent responsible technical position with an Independent telephone company in Pennsylvania, Virginia or West Virginia. Thoroughly trained in step-by-step dial switching and toll ticketing systems. Telephone engineering and supervisory experience. Write Box No. 4343, c/o TELEPHONY.

HELP WANTED

CABLE SPLICERS experienced and able to work alone on REA projects. Call or write Mullen Construction Co., Inc. — Appleton, Wis., P.O. Box 378, phone RE 4-9881; Newburgh, Ind., Box 356, phone UL 3-8931; Windom, Tex., phone 8; Crescent City, Fla., P.O. Box 59, phone OW 8-6361.

MANUFACTURER'S REPRESENTATIVE — WANTED TO HANDLE LINE OF SPECIALIZED TELEPHONE EQUIPMENT. WRITE BOX NO. 4341, c/o TELEPHONY.

AMBITIOUS MEN qualified as Station Installers, Equipment Installers, Cable Splicers, Linemen. Work in Midwest. Harris-McBurney Company, Inc., P.O. Box 267, Jackson, Mich.

TELEPHONE ENGINEER with design and construction experience for Project Engineer position in West Indies. Write Box No. 4336, c/o TELEPHONY.

MANAGER FOR RAPIDLY EXPANDING COMMERCIAL (cooperative) Rural Telephone System located at Union, Iowa. Must have administrative ability to achieve and maintain efficient operations and develop sound expansion programs. Ability to hire, train and direct personnel in all phases of telephone operations. Technical, plant and commercial knowledge and experience desired. Permanent position carrying substantial opportunity for qualified person. Replies confidential. Applications must be in by February 20, 1960. Please write Jesse Broer, Pres., New Providence, Iowa.

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CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1800 Johnson St., Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

A COMPANY IN NORTHERN ILLINOIS (12 exchanges) has an opening for an Installer-Repairman, experienced dial plant maintenance. Excellent working conditions. Must be high school graduate. Ideal opportunity for proper person. Give references, salary expected and full information in reply to Box No. 4346, c/o TELEPHONY.

A COMPANY IN NORTHERN ILLINOIS (12 exchanges) has an opening for an experienced telephone lineman. Excellent working conditions. Must be high school graduate. Ideal opportunity for proper person. Give references, salary expected and full information in reply to Box No. 4347, c/o TELEPHONY.

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WANTED ALL MAKES OLD TELEPHONES—our truck will pick up and pay you Cash on the spot. Telephone Co., Turtle Lake, Wis.

TELEPHONES—all types—any condition, candlesticks, wall sets, etc. Write advising quantities available. Our trucks will pick up. Reply to Box No. 3952, c/o TELEPHONY.

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NORTH McBERTY MCX-500 ALL RELAY SYSTEM — 400 private lines equipped with Code Ringing for 8 parties per line. Maximum 3200 Party Lines (100 Lines Additional Capacity).
4 groups, 9 links per group, 9 manual office trunks, 20 pay station lines, 4 P.B.X. Groups, 8 outgoing and 7 incoming trunks with necessary power and signalling equipment for operation.
Two 110 Volt Rectifiers for Charging Battery, operated on 24 Volt DC System.
Condition Excellent—used by Southern Bell Telephone Company. Approx. 10 Years Old. Can be added to other existing equipment. Fully automatic—no personnel needed to operate. Blueprints and test equipment included in Purchase Price.
Ideal for small town where a modern communications system is desired. Also ideal for a community, large company or plantation style town where private company controls its own telephone exchange.
AVAILABLE FOR INSPECTION GREENVILLE, S. C.
GENERAL PURPOSE MACHINERY & EQUIPMENT CO., S.A.
374 BROADWAY NEW YORK 13, N. Y.

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WESTERN ELECTRIC #12 SWITCHBOARD

4 Positions (15 Cord Pairs per position) Cord Circuit #SD-15178-01 Universal 2 party Selective or 4 party Semi-Selective Ringing with single key operation.

480 Lines, 1 full multiple on 4 panel basis.

48 Strips, W.E. #275 Jacks on 217A Mtg. (20 per)

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1 Dial and Dial Cord per position.

1 Power & Battery Rack with Charger less Batteries.

All Jack and Lamp Strips are wired to Terminal Blocks ready for easy installation.

Equipment offered is in good condition "as removed from service." Available immediately.

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LEICH 901-wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service, no broken or missing parts, $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wis.

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TWO NCR BILLERS. Both Model 31-10-08. 16" carriage. Five years old. One NCR Straight Line Biller. Model 21112 (119) 169-Standard. Two IBM Toll Billers. Serial Numbers 213172 and 213173. Eleven years old. Three Ticket Sorting Racks. Grey finish—like new. Orange County Telephone Co., Middletown, N. Y.

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This equipment is in perfect running condition. In new grey color. 5 only available Model 21112 (119) 11 Totals 7 column for billing. 5 column for identification. Priced new approximately $8,000. Our price $1,500. Also 10—8 totals only Model 20812 (111T), same specifications as above. Priced new $5,000. Our price $850.00. Write Box No. 4342, c/o TELEPHONY.

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PROMPT DELIVERY FROM STOCK
Send for Bargain Stock List No. CS.
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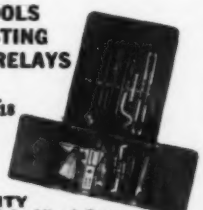
Workmanship Guaranteed • Speedy Service

KIT OF TOOLS FOR ADJUSTING All Types OF RELAYS



No. TK-18
$34.00

18 HIGH QUALITY NEUSES TOOLS In Vinyl Case
Everything you need — Thickness Gauges; Spring Tension Gauge; Contact Burnisher; "Relay designed" Wrenches.
Order direct or write.
P. K. NEUSES, INC.
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Brand New POLE STEPS at fraction of reg. cost!

Standard, **Hubbard 7125,** 5/8" dia., 10" length—open hearth steel, fetter drive thread, hot dip galvanized. Manufactured to approved standards.

Intelligent, volume purchase makes extreme low prices possible on any quantity! Immediate delivery from our Los Angeles or Santa Ana stocks.
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PINE POLES
Creosote Oil or Pentachlorophenol
Boston, Mass. — Portsmouth, Va.
New York, N. Y. — Philadelphia, Pa.
Savannah, Ga.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co. — Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Dierks Forests, Inc., Wood Preserving Division, 810 Whittington Ave., Hot Springs, Arkansas. Southern Pine select poles all sizes and lengths, pressure-treated, creosote or penta. Also creosote-2% penta mixture. Prompt shipment.

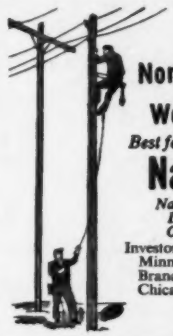
Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Wood Preserving Division — 926 Grand Avenue, Kansas City, Missouri—"LONG-BELL" pressure-treated Southern Pine and Douglas Fir Poles—Creosote or Penta.

Piedmont Wood Preserving Company —Creosoted and Creosote-Penta Treated Pine Poles. Plant, Augusta, Georgia. Yards, Virginia, West Virginia and Connecticut. Address inquiries to Box 1662, Spartanburg, S. C.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."



Northern white cedar
•
Western red cedar
Best for durability... poles from
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National Pole and Treating Division, Minnesota and Ontario Paper Company
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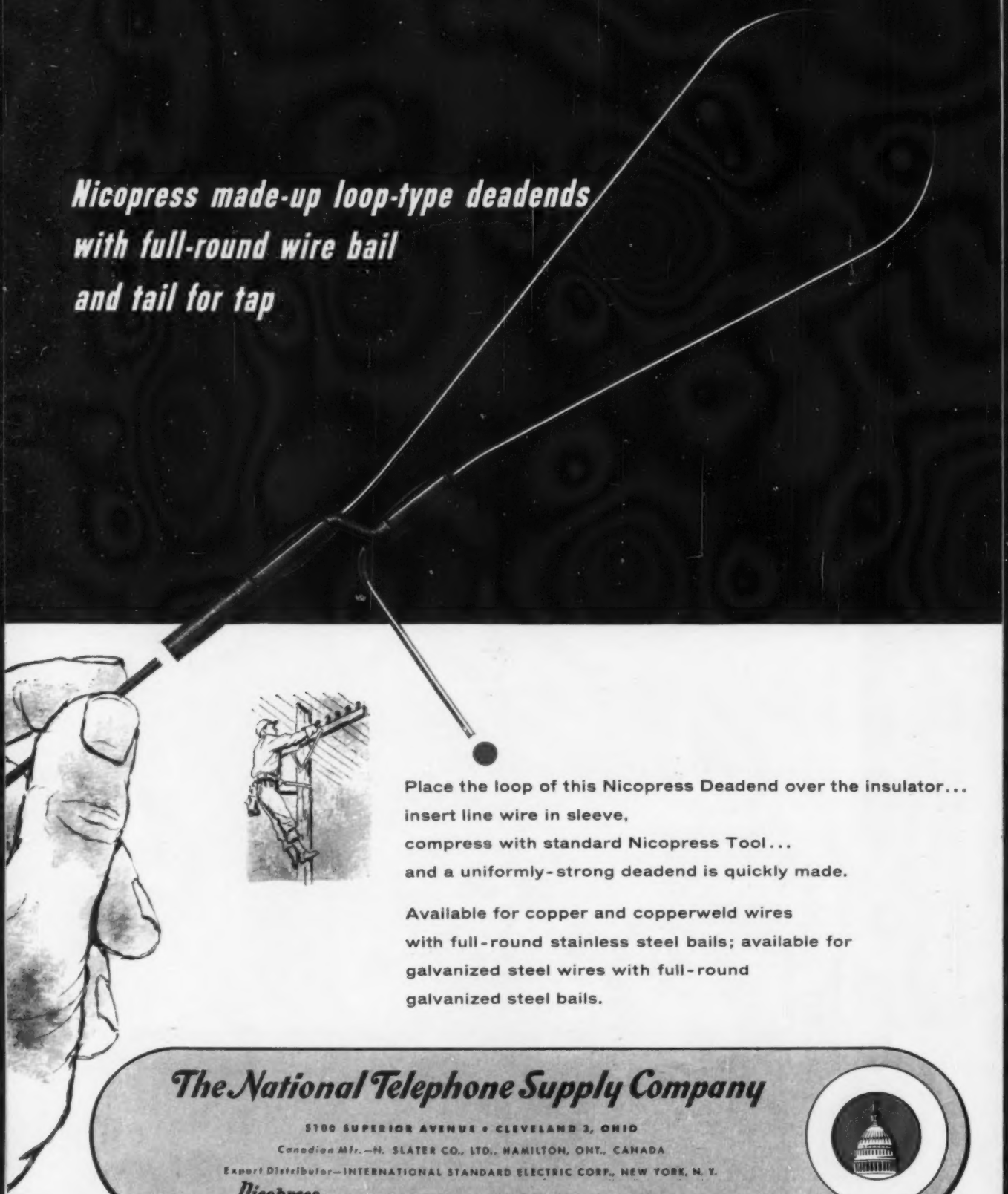

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